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A METHOD FOR ASSESSING SOCIAL CONTACT: ITS APPLICATION DURING A REHABILITATION PROGRAM ON A PSYCHIATRIC WARD

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The purpose of this paper is to describe a method for assessing the daily social contact of patients on a psychiatric ward, and to present some of the uses of the information derived from the application of this method.

The need for adequate and reliable ways of assessing change in a patient's behavior is one of the most important problems in psychiatric research (2). The clinical research worker most often uses symptom scales or clinical judgment to measure change (7, 9, 11). Each of these methods is useful for answering specific questions, but both have certain shortcomings. To make statistical analysis possible, scales are often constructed from general items, quantified as if progress in each item is equally important for each patient. On such a scale a mute patient who begins to talk, and thereby demonstrates his paranoid ideas, might be rated as worse. This may contradict the clinical judgment that the patient is actually better. If we knew, perhaps, that the patient was increasing the quantity of his social contact, this might enable us to make a more valid judgment. In addition, items in such scales fail to capture the nuances of each individual patient's behavioral fluctuations. In one patient, for example, evidence of improvement seemed best demonstrated by a change from such indirect comments as, "Some people feel only coldness from others," to more direct ones, such as, "I feel you don't care about me; you spend more time with others." Such an item, which might be irrelevant for most patients, would be absent from a scale. Again, some objective evidence of the patient's changing social behavior might help us evaluate his clinical status. Clinical judgment, while more directly stemming from the individual patient, leaves the questions of quantification and comparison in doubt. The use of a combination of scales and clinical impression still leaves a need for other techniques for viewing the patient's social behavior.

One possible aid to the problem of assessing change is to create objective techniques for measuring some of the discrete, quantifiable elements of social behavior that are thought to be relevant to the clinical condition under study (12). These elements, while not themselves sufficient to portray completely a changing clinical condition, might be useful adjuncts to clinical observation, to scales, or to a combination of the two. In studying the progress of rehabilitation efforts with hospitalized schizophrenic patients, the quantity and pattern of social contact would appear to be elements important in their illness, for they relate to withdrawal and to isolation. Also, they could be objectively studied. Our goal was to develop a method for studying these variables.

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In hospital psychiatry, social contact is one of the major components of almost every therapeutic concept. Nursing personnel, ward administrators and psychotherapists are all concerned with daily changes in social activity (10). The present study was not intended to create a substitute for an intensive examination of the quality and purposes of interaction. On the contrary, it was intended as an aid to clinical observation, to provide a more complete picture of a patient's changing interpersonal capacity.

The study of social contact would seem to demand a method that describes not only the individual under scrutiny, but also the group within which he is reacting. The ward was chosen as the setting within which interaction would be studied. Our aim was to be able to assess the quantity and the pattern of contact of the individual patient, the quantity and the pattern of contact of the group with which he is most closely associated, and the quantity and pattern of contact of the ward as a whole. We wanted to have the opportunity to observe the daily fluctuations of these variables, which would thus provide a moving picture, rather than isolated or end-point snapshots, as it were. In addition, we wished to be able to summate daily observations over selected periods. We hoped, thereby, to provide an objective index of one aspect of social behavior, as a means of supplementing clinical observations. This communication describes a method that has been evolved. The method makes use of a social contact "map" which we have called a *Social Contact Matrix*.

DESCRIPTION OF THE MATRIX

The *matrix*, as illustrated by Figure 1, was constructed by marking off a grid of one inch squares on a large cork bulletin board. In the squares along the diagonal were placed the names of all patients on the ward in which the study took place. (In this paper, the names of the patients were represented by numbers.) On each side of the diagonal, every pair of patients is represented by a box, which we have termed the *contact* box. These boxes, one on each side of the diagonal, may be located as follows: on the right side of the diagonal, starting with the patient who is higher on the diagonal, one proceeds horizontally to the right and stops at the box which is vertically over the second patient. On the left side of the diagonal, starting with the patient who is the lower of the two along the diagonal, one proceeds horizontally to the left and stops at the box which is vertically under the other patient. Also along the diagonal are the categories *staff*, *alone*, *off ward* and *POW* (with patients from other wards), so that a count also could be made for each patient, of the number of times of his being alone, off ward, with the staff, or with a patient from another ward. Patients were observed and social contacts recorded at eight periods during the day. The eight check times were the three mealtimes and five other times, selected during the day and evening. For the remainder of this paper, the check times will be referred to as *mealtimes* and as *other* times. *Mealtime* observations were placed on the right side of the diagonal, and the five check times noted as *other* were placed to the left.

Contact was defined as two or more patients being together and showing any evidence of interaction, verbal or otherwise, for at least several seconds. A request for a cigarette, a recognizing glance, a delusion suddenly voiced involving a mutual subject, all were among those things considered evidence of interaction. Geographic proximity alone was not considered sufficient. Social contact at mealtime was defined as two or more people eating together and showing some evidence of interaction. Enough tables were available so that the patients could choose to sit alone, with patients from another ward, or with patients from their own ward.

The nursing staff on duty went about the ward and observed who was with whom, then gathered at the *matrix*, which was kept in a staff room, inaccessible to the

patients. They compared the notes that they had written and made judgments together, placing small colored map tacks in the appropriate boxes. Thus for example, if two patients were together at a *mealtime* check, a tack was placed in their *contact* box to the right of the diagonal. If two patients were together at an *other* time, a tack was placed in their contact box to the left of the diagonal. If a patient was alone a tack was placed in her *alone* box, which, at mealtime, is that box in the *alone* column which is horizontal to her number. At the *other* times her *alone* box is that box in the *alone* row which is vertical to her number. This same arrangement also exists for the remaining categories along the diagonal. Each patient received at least one tack at each check time. If more than two patients were together in a group activity such as playing cards, it was assumed that some contact existed between each possible pair. By a system of colors, later changed to initials, the tacks were coded for the days of the week.

Preliminary investigation was made during the period when the method was being developed, in order to select specific *other* times during the day and evening, when the patients might be found not to be working or otherwise involved in ways that might preclude socializing on the ward. For example, times were chosen such as after breakfast but before the day's activities began, or after supper but before the evening social events (1).[2] Care was taken to avoid having the *other* check times coincide with organized activities, since this would have artificially increased the quantity of "spontaneous" contact.

The names along the diagonal were first arranged alphabetically, but then were rearranged, so that the patients who were habitually together were next to each other on the diagonal. This made the group patterning more vivid and deviations from the usual more quickly apparent. The tacks were allowed to collect on the *matrix* for a whole week, and so, within a few days, clusters of pins appeared, representing social groups. In contrast, patients who had not had any contact during the week were made conspicuous by the absence of pins in their *contact* boxes and the presence of many pins in their *alone* boxes. The week's results were recorded by copying the number of pins onto a large paper grid and, occasionally, also by photographing the *matrix*.

WARD SETTING

In order to provide a context in which to describe in more detail some of the uses of the *matrix*, a brief description follows of the ward on which this study took place and of the rehabilitation program started at the same time as this project. The *matrix* was used to record the quantity and pattern of social contact from the time of the initiation of the therapeutic program.

Ward Two is part of a large hospital caring for nearly eight thousand patients. It is situated with seven other wards and several basic science laboratories in a building recently designated as a research service.[3] This ward is open and, at the beginning of the study, contained 29 female patients, 24 of whom were suffering from chronic schizophrenia.[4] The average length of stay in the hospital was five and one half years, and the average stay on the ward was three years. The age range was from 27 to 59. Before the beginning of the study, the ward staff had consisted of a head nurse and three nursing

[2] The observations were made within each of the following fifteen-minute periods, as well as during each mealtime:

8:15 A.M. to 8:30 A.M.
11:30 A.M. to 11:45 A.M.
4:15 P.M. to 4:30 P.M.
7:15 P.M. to 7:30 P.M.
8:45 P.M. to 9:00 P.M.

[3] The Clinical Neuropharmacology Research Center, a Laboratory of the National Institute of Mental Health.

[4] The diagnoses were made independently by hospital staff psychiatrists and by the author. The criteria used were those outlined under the heading "Schizophrenic Reactions" in the manual entitled *Mental Disorders*, published by the American Psychiatric Association, 1952.

assistants—one nursing assistant for the day shift, one for the evening shift and one for the night shift. The physician in charge of the service had shared responsibility for 331 patients with one other physician. These two had been the only psychiatrists available; neither had much time to spend on Ward Two. Shortly before this project was started, the author was added to the staff, in order to serve full time as the ward physician, and to initiate and carry out research.

The atmosphere was like that of many open, chronic wards in large mental hospitals. Many patients wore rather drab hospital dresses; some wore their own clothes and were fairly well groomed. The ward was quiet, the only apparent expressions of anger being brief, noisy outbursts, usually from the same patient. Ward chores were usually assigned and carried out by the patients, urged on continuously by the staff. A subtle attitude of negativism and apathy existed in the patients, and a feeling of futility in the staff. The ward personnel felt that the patients would do very little unless pressure was applied constantly. Patients often said that their sickness was greatly exaggerated by "The Hospital" and that their stay was largely enforced from the outside by administrative officials, who appeared to them to be unconcerned. Along with this need to think of the hospital as responsible for their continued stay, there seemed to be a marked absence of effort directed toward regaining health in order to leave the hospital. The patients seemed to be afraid to think of leaving. There was very little stimulation from the staff to change this attitude. A sense of timelessness pervaded both patients and staff. A five-year hospitalization was not remarkable to anyone; nor was a fifteen or twenty-year employment of staff members at Saint Elizabeths at all unusual. There were few resources available to aid in the transition from the hospital to the community. Both patients and staff seemed reconciled to the "fact" of permanent hospitalization. One or two patients worked in the city, a few worked on the grounds, and most of them did not work at all. The population on the ward was almost unchanging, two or three patients coming to the ward annually and two or three leaving. The atmosphere just described had been the same for many years, according to the personnel. Most of the staff had themselves worked either on Ward Two or in the building for a long period of time.

The problems described here are not unique to this hospital; they have been described in many other understaffed, large institutions, whose problems are greatly neglected by both the community and many psychiatrists (3). The small hospital, whether or not it is affiliated with a university, has similar difficulties (4, 13).

THE THERAPEUTIC PROGRAM

Group therapy and other kinds of group experience were central to the modified treatment efforts. Large, open discussion groups were held three times weekly for the entire ward. These were led by one of the hospital staff psychiatrists who had been working at Saint Elizabeths prior to the study.[5] These groups were focused toward discussion of fears about leaving the hospital. In addition, each patient belonged to one of four psychotherapy groups, made up of about eight patients each, which met once weekly. Patients continued to attend the small group meetings even after discharge, in order to facilitate a transition from the ward to the community. These small groups were led by the ward psychiatrist. The role of both group leaders was intended to be one of actively seeking out each patient, the focus of discussion being on the tendency the patients had to withdraw and not to participate in the discussion of problems or feelings.

A half-hour patient-staff meeting was held each day, during which events and reactions were discussed openly in an effort to diminish the distance between patients

[5] Leon Konchegul, M.D.

and staff, as well as to increase the participation of the patients in the ward program. This was led by the ward psychiatrist or, in his absence, by the nurse or nursing assistant available. Criticism by the patients of staff techniques and attitudes was strongly invited. Here, one focus was on the idea that the therapeutic program was the business of both patients and staff.

Once a week a "patient-government" meeting was held. This was not attended by staff members. The patients were urged to make decisions in certain clearly defined areas where it seemed therapeutically useful for them to do so. These areas concerned such matters as assigning housekeeping chores, handling much of the anti-social behavior that occurred, and planning the ward social events.

A major goal from the beginning was the active participation with all the patients by the entire ward staff during as much of the day and evening as possible. Thus, all of the staff urged patients to discuss anxieties, including the need the patients felt for being nurtured, or the fear they had of leaving the support of the ward. Through direct comment and unambiguous attitudes, the staff attempted to maintain the highest level of expectation possible for each individual patient. The decision to look for a job outside the hospital was left to the patient to make, unless it was felt that the patient could not do so without support. At these times the staff did not hesitate to urge the patient to look for a job (9).

Ward staff meetings were held each day in order to reassess frequently the reactions of both staff members and patients to the day's events, as well as to reassess the appropriate level of expectation for each patient. Even brief contacts between staff members and patients were scrutinized by the entire ward team. The ward team was in this way intended to function as an aid for each staff member, including the physician, to increase his or her self-awareness. Open expression at these staff meetings was encouraged, as in meetings attended by patients.

RESULTS

The outcome of the rehabilitation program, through week 27, will be discussed first from the viewpoint of certain clinical observations. The changes in the *Social Contact Matrix* seen during the course of the study will then be described. This division is made in order to demonstrate the use of the *matrix* as an adjunct to clinical observation.

ASSESSMENT OF CHANGE: CLINICAL OBSERVATION

The most striking observation was the latent capacity of the patients for healthier behavior. From an atmosphere of marked apathy and withdrawal there was a gradual increase in activity. This increase first became noticeable at about weeks 12 through 14. The large discussion groups, instead of being characterized by long periods of silence between comments, became forums for heated argument about such things as whether a staff member was right in urging a certain patient to go into the city to "window shop." Jobs became a major subject of discussion in these meetings. Problems were brought up such as whether or not employers should be told that a patient resided in a mental hospital. From a beginning of "watchful waiting" with all eyes fixed on the group leader, a gradual evolution took place, until the leader could be absent completely from patient-staff meetings without a sullen silence resulting. As jobs increased in importance, the sicker patients tended to need support to ward off the feeling that they were becoming isolated by being unable to keep pace with other patients. One patient, for example, began to hear a voice which told her to get a job. When she said this at a patient-staff meeting, another patient replied that the voice sounded like Dr. K's, to which the entire group responded with warm laughter, including the patient hearing

the voice. When this same patient obtained a job, she became nauseated at a patient-staff meeting; and one patient thereupon ventured that she "figured the ward should collect some money to buy a bucket to pass around, since everybody seemed to need it from time to time".[6] Thus, the patients who were better integrated gradually assumed part of the responsibility for supporting the sicker patients.

In the small group meetings the "why bother us?" attitude, which was accompanied by great distrust and anxiety, was eventually replaced with a more open discussion, sometimes very angry, of the group leader's motives in "pushing people" toward activity, and toward thinking about and discussing their positions in the hospital. Family pressures were discussed which awaited the patients outside the hospital, and even inside if a patient should show signs of recovering. There was, frequently, an air of "I'm only doing this because you're making me," a statement made by one patient, for example, who had just started wearing lipstick for the first time in ten years.

The continued presence, in the small groups, of patients who had successfully left the ward seemed to help them continue to gain strength, and also appeared to support the rest of the group in thinking about eventually leaving the hospital.

Gradually, expression of feelings became more direct. By degrees, psychotic behavior was limited to brief moments of reaction, most often stimulated by increased pressure to participate in activities outside of the hospital. The ward psychiatrist, as well as each staff member, found that dropping a more "correct" or distant appearance, and imparting affect into his or her contacts with patients, seemed to foster more alive and expressive staff-patient relationships. Thus an angry comment by a patient might be answered with equal vigor by a staff member, if it seemed appropriate.

By the seventh month of the study the number of full-time jobs held by patients in the city had increased from three to twelve, the amount of ataractic medication taken by the patients had decreased eight-fold, and the number of patients who had privileges to go into the city without supervision had increased from one-third to three-quarters of the ward population. There were, however, two unsuccessful attempts at suicide and these two patients were transferred to a closed ward. The atmosphere on the ward had changed markedly toward being more active and healthy. Physically, the ward looked different. The long, solemn row of chairs in front of the television set was gone, replaced by intimate circles of seats around low tables. The patients had painted the furniture bright colors and had decorated the ward with plants and curtains. Hospital dresses now were worn for housework only, first by order of the staff, then by common consent. The need for continuous prodding by the staff to get patients to participate in social activities was markedly decreased. However, there was a subtle awareness, often noted by both patients and staff, that the changes described depended, to some extent, for their stability on the staff's continued interest.

ASSESSMENT OF CHANGE: SOCIAL CONTACT MATRIX

Figure 1 is the *matrix* on which week eleven is recorded. This week was chosen because it was the first week that the *off-ward* and *alone* categories had been used to account for patients when they were not interacting. Earlier weeks, which showed only the interaction areas, demonstrated a remarkable emptiness in the side marked *other* and a rigid, unvarying group pattern at *mealtimes*; thus the validity of the division of the *matrix* into two sections was supported. It was not until the ninth week that any notable increase appeared in quantity of

[6] Humor was often used in this way by both patients and staff as a means of expressing warmth, and even of making interpretations.

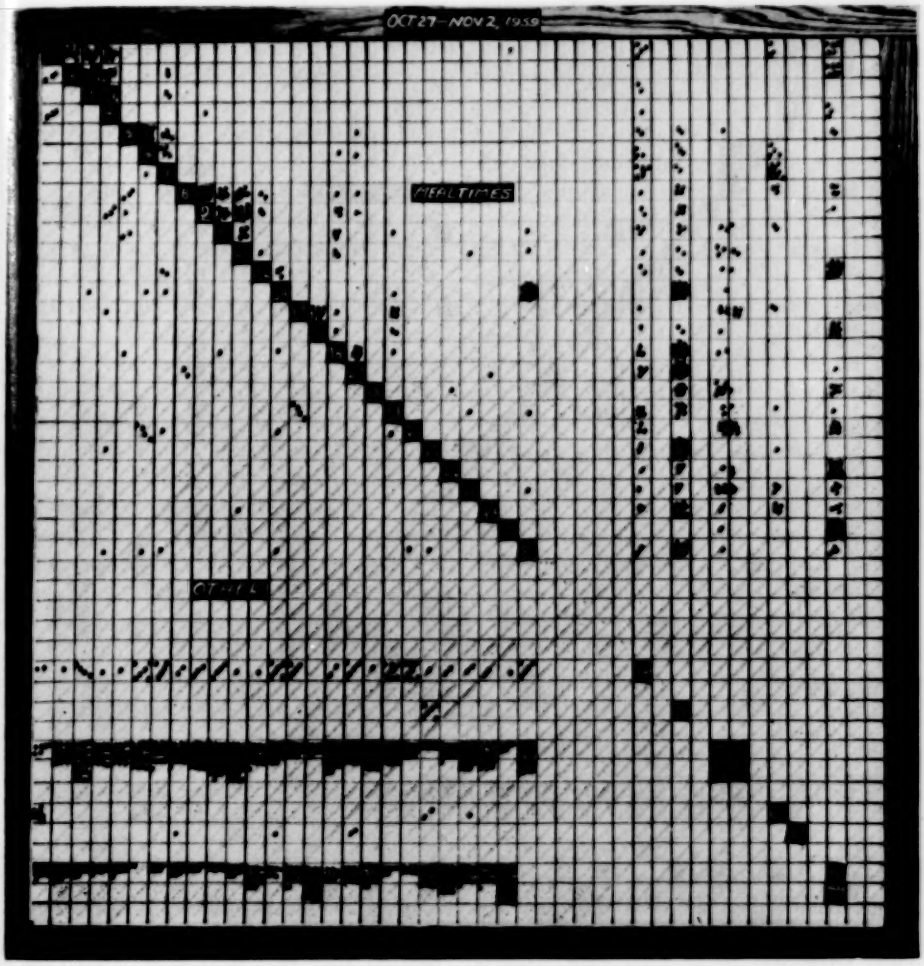

FIG. 1. Social Contact Matrix: Week Eleven

contact. The group pattern of week eleven remains much like that of the first week, with the exception of a new relationship developing between patients 13 and 26.

Figure 2 is the *Social Contact Matrix* twenty-seven weeks[7] after the beginning of the study, and sixteen weeks after Figure 1. It seems obvious, after comparing these two figures, that a major change has occurred in the patterns and quantity of social contact on the ward. The change in the order of patients along the diagonal represents a growing lability in group pattern, as well as the addition of several new patients from another ward. There is now a group of five patients, whereas in the early weeks the largest groups contained four persons. There are fewer isolated patients and far more (over five times as much) interaction on the side marked *other*. There is a loosening-up of the rigidity of the social structure at

[7] In this figure the category *off ward*, which appears on Figure 1, is broken down into *industrial therapy*, *working in the city*, *home visit* and *other*.

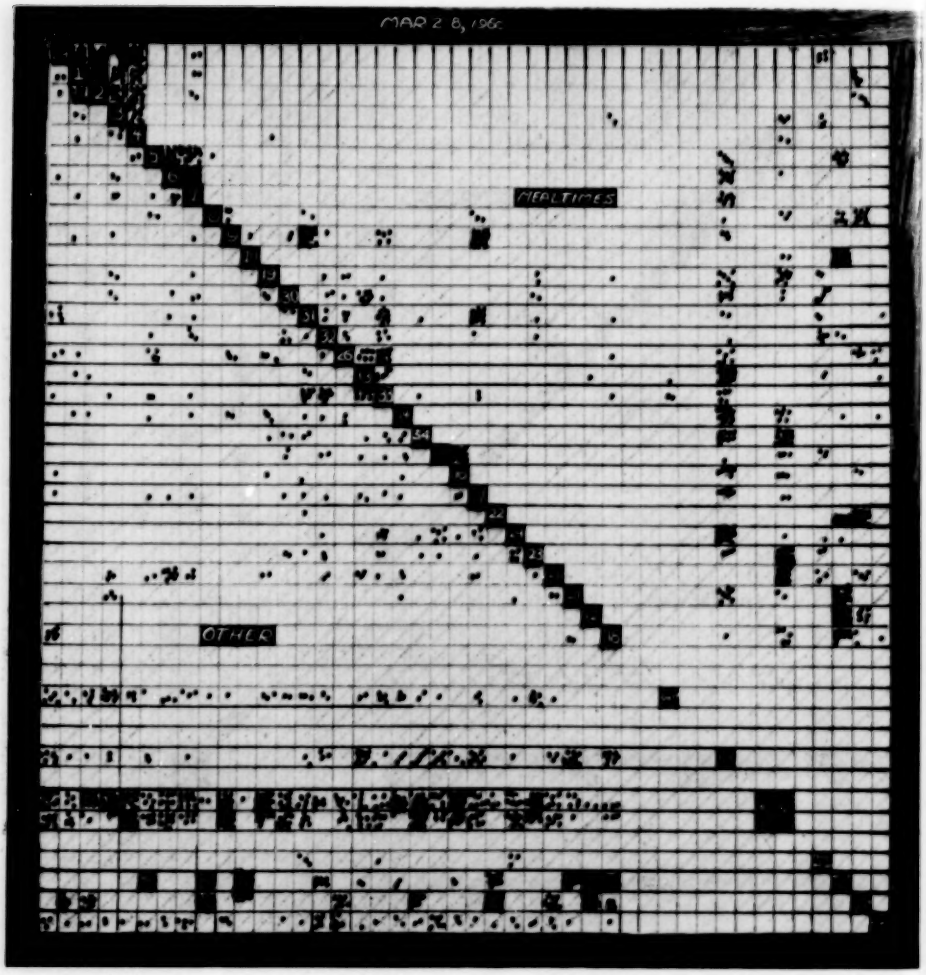

FIG. 2. Social Contact Matrix: Week Twenty-Seven

mealtimes, so that each patient has contact with more individuals than before, although there are still consistent groupings. Patient 11, for example, illustrates this change by the increase in her contact during the *other* times. She has been in the hospital over 28 years and came to Ward Two several months before the study. Her diagnosis is chronic catatonic schizophrenia. During week eleven the patient was alone 24 times; she was off the ward 10 times and interacted with only one other patient during the *other* check times. However, during the more structured *mealtimes* the patient was a member of a group along with patients 8, 9, 10 and, occasionally, ate with several other patients. By week twenty-seven, the patient had increased her quantity of social contact during the *other* times from one to fourteen and was alone only eleven times during this week. On *mealtimes* side, she ate with fewer patients but by week 27 had formed a strong bond with patient 16, an alliance which manifested itself only during *mealtimes*.

Patient 16 was at about the same level of illness as patient 11. From the point of view of clinical observation, her personal appearance had changed along with her increased socialization; she dressed and spoke more appropriately and, after several weeks, was able to hold a small job in the hospital as a clerk-typist. Hallucinations, which had been almost continuous, had decreased, occurring only infrequently.

After several weeks the *matrix* became the base from which the treatment program proceeded and developed. It provided an overall view of the quantity and patterning of the social life of the ward. It enabled the staff to note the more isolated patients and quickly to direct its attention toward them. It offered information of value about the group patterns. For example, when the individuals in the group were studied, it was found that there was one "elite" group presided over by a "queen." This patient sat in a chair not often used by others and rocked quietly in a regal manner. The staff began to notice that she usually made decisions for the rest of the ward at group meetings, and generally had the last word. Her comments were usually directed to the other members of her group, rather than to the ward as a whole or to the particular patient to whom they pertained.

It was found also that many of the sicker schizophrenic patients tended to be those who operated in pairs or were more isolated. Some of these patients actually acted as servants for the "elite" group, doing chores for them in return for small gratuities. The "elite" group, which was put at the top on both Figures 1 and 2, held most of the prestige symbols, such as private rooms, private therapists, the table with the best view in the cafeteria, and the less menial of the ward chores. It was with a great deal of suprise that the staff began to realize that the group which had come into view, by means of the *matrix*, turned out to contain the patients with the great bulk of the advantages the ward had to offer. The cohesive force holding the "elite" group together seemed to be an aspiration the members shared for social dominance. Social position prior to hospitalization played some role; but, for some patients, the ward offered the first opportunity for a position of prestige. The group denied racial prejudice but often exhibited it in subtle ways, such as by not allowing room for a Negro patient to sit next to them.

The hierarchical social structure appeared also to depend on degree of illness. It was noted that patients tended to socialize with others at their own level of illness; but when a patient improved, she often found it difficult to contact patients at a higher level. A series of rebuffs to such a patient was sometimes followed by relapse. At one point several patients who had been very isolated were seen, by means of the *matrix*, to be increasing their quantity of social contact. When special attention was focused on the nature of these new contacts they were found to be overtures for friendship to better integrated patients. In private interviews the patients who were approached spoke of the feeling of embarrassment these contacts caused them, due to the ward caste system, which imposed sanctions against socializing outside of one's group. This was expressed by such comments as, "It's certainly wonderful that she's better, and I like her myself, but the people I'm friendly with have never associated much with her. Her friends are much sicker, you know." After a time the patients who were making the overtures grouped together, mostly in pairs. Those who did not, once again became more isolated.

In assigning the patients to the small groups for therapy, we attempted to avoid duplication of the cliques in existence on the ward, so as to avoid acceptance of the patients' tendency to label themselves as upper or lower class. The patients, however, appeared, at first, to want to be in groups with those persons with whom they generally associated When this matter was raised in group-

therapy sessions, the subject of the "aristocracy" was directly discussed. This seemed useful in loosening its rigidity and allowing a freer movement of friendship patterns. This kind of information was first suggested by the *matrix* and then developed by observation, individual interviews, and group discussion. It slowly became fundamental in understanding the daily ward life and its relationship to the exacerbations and remissions of symptoms.

At another level the use of the *matrix* had a marked effect on the ward staff. The collaboration in collecting the data, and the discussion that invariably accompanied it, helped to unify the staff and to clarify their therapeutic goals. The staff began to talk over therapeutic problems in terms of the degree of a patient's isolation. This seemed to decrease the aimless and hopeless feeling that each staff member often had felt previously. Noting social contact, watching it fluctuate for the ward as well as for the individual patient, talking in terms of how alone a given patient might be, all of these new therapeutic functions outlined a goal for each contact between staff-member and patient. Their aim became helping the patient relate to other people comfortably and without distortion. Previously, each of the personnel had felt the need for developing her own concepts, with which she explained to herself, for example, a patient's rejecting response. Often these concepts led to antitherapeutic behavior. In the pre-testing period, when various trials were being made, the staff was asked to use blue pins for psychotic contacts and white pins for social ones. It rapidly became clear that, for some of the staff, any noise or display of anger was thought to be psychotic. Patients who "spoke up" were often rated as psychotic, whereas patients who remained quiet were seen as not psychotic. The use of the *matrix* did not magically change all of this, but it did help provide a way of redirecting staff values and goals. Sickness became more than the presence of anger, or even of delusions or depression. The staff began to speak of the patients in terms of the ease with which the patients approached and interacted with others, and the degree of social incapacity was viewed as the best measure of illness. The functions of an appropriate nursing role, and of staff-patient interaction had, therefore, become more rational and understandable as health-producing influences.

DISCUSSION

In assessing the changes that occurred, it seems clear that clinical observation was fundamental—observation of the ward as a whole, as well as of individual patients. It is, however, the thesis of this paper that the objective observation of several discrete social variables is a useful complement for a more complete clinical picture.

The limitations of the *matrix* lie in two areas. First, the information which can be gathered from it does not in itself indicate whether a patient is improved or not; it indicates only that certain changes in several discrete aspects of social behavior have occurred. Thus a manic patient who increases her quantity of social contact might be worse, while a catatonic patient who does so might be better. To our knowledge, the study of non-psychiatric wards in terms of the pattern and quantity of social contact, has not yet been done. It cannot, therefore, be assumed without doubt that social isolation is necessarily a product of mental illness alone. The *matrix* does not provide information about the quality of the social contacts which are registered. It must be seen as an adjunct to clinical observation, and information gathered from it must be weighed in the light of the more complete picture of each individual patient.

The second area of limitation lies in the amount of time and investment necessary to carry out the method. In our experience agreement between observers, which was tested early in the study, was very high; and it was found that the observations could be

made reliably by the average nursing aide.[8] On the other hand a high degree of motivation was necessary if the operation was to continue beyond a very few days. In this study the motivation came from the fact of membership in a ward team, central to which was the ward physician. His continued support and direction seemed essential. The time necessary for training personnel, of course, depends on many factors; but, if a reasonable interest exists, a period of two to three weeks seems adequate. This has been the experience gained from two wards with two separate teams at Saint Elizabeths Hospital.

To fully evaluate the results of the rehabilitation program, the full nature of the changes that occurred in the patients needs further study. Whether the program outlined was the specific stimulus necessary to produce these results, or whether only certain aspects were necessary, is a question not yet answered. Nor is the stability of the changes known. There is a strong impression that many of the patients passed from a stage of apathy through one of pseudo-activity, in an effort to comply with the staff's wishes, but with a reservation which at times was quite conscious. From this stage there seemed to follow a more stable one, in which some patients found it gratifying to be more active, not only to please the staff, but also to please themselves. There is also a strong impression that the activity of the patients, at least through the middle of the study, was directly proportional to that of the staff. At times, when the staff was exhausted, there seemed to be a clear drop in the patients' activity as well. A more objective study of this relationship seems important.

There appears to be a direct relationship between the impressions described under clinical observations and the changes indicated by the *matrix*. It seems clear that the increased "spontaneous" activity of the patients followed the staff's increased optimism and active engagement with the patients.

At present there is a study under way on Ward Two to determine the relationship between ward events, daily fluctuation of symptoms and social contact.[9] The relationship between social contact and psychological, psychopharmacological, psychophysiological, as well as interpersonal variables could be studied in a similar manner. The use of the *matrix* in a multi-ward research project is being contemplated. In this study a means must be found to identify some of the relevant differences between the various ward environments. By means of the *matrix*, the average number of interpatient contacts, and of staff-patient contacts, per day, on each ward, can be ascertained with ease and relative objectivity. This information may be a useful adjunct to the total picture of each ward.

Data obtained in this manner lend themselves to various methods of statistical analysis. Daily quantity of contact, daily "aloneness," or quantity of contact among members of a group or of a ward can be handled mathematically (5, 6). A number of quantities can be read easily from the board, such as, the number of contacts a given patient has had each day, or the number of patients she has contacted. The relative amount of socializing on the ward each day may be expressed as the average number of contacts.

SUMMARY

A method has been described for assessing, in a relatively objective manner, fluctuation in the amount and pattern of social contact

[8] Later in the study, a measure of inter-rater agreement was made. Staff members were asked to go about the ward in pairs and to make independent judgments concerning whether the patients on the ward were alone or socializing (as defined earlier in this paper). Out of 457 judgments, there was agreement 452 times.

[9] This study is being carried out in collaboration with Jacob B. Chassan, Ph.D., of the United States Department of Health, Education and Welfare, whose participation involves statistical methodology and analysis.

for any given patient in a ward environment, as well as for the ward as a whole. The method is thought to be a useful supplement to any means of clinical assessment of patients, and may be used for more documented research into other interpersonal aspects of psychopathology. Its use in a ward therapeutic program has been described.

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COMPONENTS OF EROTICISM IN MAN: II. THE ORGASM AND GENITAL SOMESTHESIA[1]

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The orgasm as a component of human eroticism is far from being an independent variable. It is, indeed, very closely related to hormonal function, as is evident in the discussion of castration and hypogonadism in the first paper (7) of the present series. Nonetheless, it is of interest to ascertain the degree to which the orgasm can be independent of other factors in sexual function.

The method of presentation in this paper is the same as that employed in Part I and Part III (8), namely, data obtained from rare patients are interpolated with references to published literature. The patients in this instance are rare because of unusual anomalies or impairments of the reproductive system (Table 1). The interviews were conducted by the author.

ORGASM AND COORDINATE VARIABLES

EMISSION AND EJACULATION DIFFERENTIATED

In males, the orgasm is associated with release from the seminal vesicles and prostate of seminal fluid which is the medium of sperm conveyance and nourishment and which is secreted only so long as there is sufficient androgen in the body. In the sequence of events leading to male orgasm, seminal fluid is released into the upper urethra from the vesicles and prostate. Semans and Langworthy (11), in an exemplary piece of research, showed that, in the male cat, the neuroanatomy and neurophysiology of emission of semen into the upper urethra is separate and distinct from ejaculation of this fluid through and out of the penis. Kuhn (6) concluded that the same distinction between emission and ejaculation is applicable to man. He made detailed neurologic studies of the spinal sex reflexes of men who, their spinal cords totally severed at the thoracic level, were paraplegic—totally paralyzed and anesthetic from the chest down.

Ejaculation is accompanied by muscular spasms in the region of the perineum and penis. The muscles of ejaculation that contract spasmodically and the nerves that fire them into action have their homologues in the female. Unfortunately, there has been no experimental work on the female cat to compare with that of Semans and Langworthy on the male. It seems a reasonable inference, however, that orgasm in both the male and female is characterized by spasmodic muscular contractions in the genitals and their vicinity. In human beings these contractions are known to be accompanied by a climax of intensified erotic sensation. The orgasm in females has always received less scientific attention than the orgasm in males. With no tell-tale signs like the ejaculate to document its occurrence, the female orgasm is difficult to study and difficult to define, apart from verbal reports of its occurrence.

DRY-RUN ORGASM: CASTRATION AND HYPOGONADISM

It is rare but not impossible for a "dry-run" orgasm—a climax of intensified erotic sensation without emission—to occur in

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TABLE I

Sexual Impairments and Number of Patients

Men with penectomy	4
Women with radical vulvectomy	2
Man (hermaphroditic) with resected prostate	1
Men with postpriapism impotence	2

adult men. One line of evidence comes from males castrated while sexually mature and functional and not given substitution therapy with male sex hormone. Castrated men lose the capacity for emission. Some lose the capacity for erection and orgasm as well. In a few instances, however, untreated castrates are claimed to have maintained the capacity for erection and orgasm, minus emission, for years (5). Claims for the occurrence of orgasm in sexually infantile eunuchs whose castration was prepubertal have not been substantiated, though such a eunuch may be capable of erection and intromission.

Among the 12 gonad-deficient men mentioned in Part I, there were no reports of orgasm resembling a dry-run ejaculation before the sex organs had matured under the influence of androgen therapy, that is before ejaculation had first been accomplished with an emission.

Reports from five hypogonadal men concerning a dry-run ejaculation during periods when they were off androgen treatment, but after they had been virilized, were difficult to evaluate—partly because of difference in masturbatory and coital habits, partly through their lack of descriptive skill as reporters. There was one man, however, whose replies to direct inquiry made it pretty clear that he had experienced emissionless orgasms. He considered these orgasms different from ejaculations with emission, in a way that he couldn't describe, and inferior to them.

DRY-RUN ORGASM: PROSTATECTOMY

There is a second line of evidence, confirmed in a personal communication from Hugh Jewett, M. D., Associate Professor of Urology, The Johns Hopkins University, concerning the occurrence of orgasm independently of emission. This evidence comes from males who have had prostatic surgery. In one such category are men who have undergone surgery for benign prostatic hypertrophy. The secretory tissue of the prostate is not totally destroyed in this operation. The gland retains its capacity to secrete seminal fluid. But this fluid, because of surgical changes at the bladder orifice, is no longer prevented from entering the bladder. Consequently, though seminal fluid is secreted in the usual way when orgasm occurs, it fails to be emitted in spurts down the urethra. Instead, it spills backward into the bladder. When ejaculatory contractions of the bulbocavernous muscles occur, the patient "fires a blank." He experiences the sensations of orgasm, but no fluid emerges.

Among males who have had prostatic surgery, a second category is comprised of cases who have undergone radical surgery for prostatic carcinoma. All the internal sex organs are removed in such cases, including the glands that produce the seminal fluid. Usually the patient loses the capacity not only for emission, but for erection and orgasm as well. A few patients, however, perhaps between one and two per cent, have reported that they remained capable of experiencing erection and the sensation of ejaculation, despite the absence of any fluid to be emitted. Vest, in a paper with Rennie and Howard (10) "observed complete preservation of erection and orgasm in two patients after radical perineal prostatectomy in which the entire prostate, seminal vesicles, ampullae of the vasa and vesical orifice were removed *en masse*."

A good account of orgasm, or at least of a feeling of climax without emission was given by the hermaphroditic man (Table 1) in whom the prostate was known to have been resected.

This patient of Goodwin, Scardino and Scott (3), was at the age of fourteen discovered to be

a true hermaphrodite with the right gonad a testis, the left an ovary. The internal accessory sexual organs combined masculine and feminine components, the male components on the right side only, among which prostate, seminal vesicle and part of the vas were identified by the pathologist following masculinizing surgical repair of the genitalia. Subsequently the sex-chromatin pattern was identified as positive (female) and in the actual chromosome count the sex chromosomes were identified as XX, except in 18.5 per cent of the plates in which the sex chromosomes were XXX, *i.e.*, with one extra X chromosome, making a total of 47 instead of the normal 46 chromosomes in these cells (2).

The patient was reared as a boy and always lived unequivocally as a man. His single testicle produced adequate androgen to maintain hormonal virilization. His hypospadiac penis, after surgical reconstruction, was adequate for coitus as well as for urination from the standing position.

At the age of twenty-three, the man was married. He had chosen a woman who already had two children because he knew he was sterile. Their sex life was totally satisfactory, judging from the patient's spontaneous and uninhibited reports. An inquiry about the "feeling" he said he got in intercourse produced the following dialogue, recorded and slightly abridged.

"I don't know. It's a good feeling. It don't last long. Climax—a climax you reach, you know. You just have to stop. You just gotta stop, you ain't going no more. And you lay there, that's all you're doing. And maybe sometimes you can get right back up on her. You never can tell. It all depends on how you're doing. . . . One night we was messing around. I just wanted to let her know how long I could really go. We went to bed about nine o'clock and I don't remember going to sleep till three o'clock. Just off and on, off and on. Didn't have nothing else to do."

"You don't think that you have any fluid that comes out of your opening at all?"

"I don't know. I don't think so. Maybe, I doubt it though."

"This perhaps is not an easy question for you to answer, but do you think it would make sense to say that when you have your climax it feels like you are shooting out something but it's just a dry run?"

"Like you said—a dry run. I just get the feeling and that's all.

"Does it have the feeling of something pumping and pushing?"

"Well, I just get a feeling—a good feeling. All I can say it's a good feeling."

Upon further inquiry the patient located the feeling as running *"all the way through my body, it looks like. It starts one place and ends up all over. It's just like that. Then you relax yourself."* He guessed that an observer could see his reaction, adding, *"Sometimes I shake a little bit, like—my legs. They get stiff. And that's it."*

ORGASM IN HYPERADRENOCORTICAL FEMALE HERMAPHRODITES

A third line of evidence in the consideration of orgasm without emission comes from patients who are virilized female hermaphrodites with hyperadrenocorticism. In the absence of cortisone therapy, these patients do not feminize: they become excessively virilized. From urological examinations of untreated patients in times past, it is known that spasmodic muscular contractions, as in penile orgasm, may be observed in the greatly enlarged clitoris, if the clitoris is sufficiently manipulated. In rare instances it is possible for the clitoris to be fetally masculinized into a normal penis. The more extreme the masculinization, the greater the chance that prostatic development will subsequently occur, provided cortisone therapy is withheld.

None of the hyperadrenocortical females listed in Table 1 of Part I had a normal-looking penis and, so far as is known, none had prostatic development sufficient to secrete fluid to be passed through a partially masculinized urogenital orifice. The orgasm of those who reported the experience was, therefore, without fluid discharge. Altogether, seventeen of these patients were old enough to be potential informants regarding orgasm. The youngest was fifteen when first seen, the oldest forty-seven. Fourteen were first interviewed about eroticism while they were still virilized and untreated, of whom five were not available for post-treatment psychologic follow-up. Of the seventeen women, nine spoke of orgasm with the authority of one who knows at first hand; four were evasive or uninformative, and four gave evidence of orgasm that was either negative or inconclusive. Among

the nine women with a positive report of orgasm, there were, before feminizing treatment with cortisone, three who had masturbatory experience only, four heterosexual experience, and two combined heterosexual and homosexual experience.

In five informants who could furnish data, comparison of orgasm before and after hormonal feminization, secondary to androgen suppression by cortisone, did not include any clear-cut delineation of changes in the quality of orgasm. One cannot be too dogmatic about the similarity of orgasm in these hyperadrenocortical patients while they were virilized and then, subsequently, feminized hormonally. There were too many other uncontrolled intervening variables in the different patients—clitorectomy, vaginoplasty, getting married, and so on. Despite its weakness, the evidence at least does not contradict the proposition that orgasm is neuromuscularly a similar experience in man and woman; and that the experience of intensified erotic sensation in orgasm is similarly described when its occurrence persists in individuals whose androgen-estrogen ratio undergoes radical change.

Neuromuscularly similar, male and female orgasms are glandularly differentiated by the secretion, emission and ejaculation of seminal fluid.

ORGASM DESPITE IMPOTENCE AFTER PRIAPISM

Though contrary to the norm, it is possible for orgasm to occur without seminal emission in a male, especially if there is a good supply of androgen in the body to maintain erectile potency. There are two cases[3] (Table 1) of men who formerly had priapism which demonstrate that orgasm can occur independently of erectile potency.

[3] One of these cases led Dr. Frederick B. Burt, Resident Urologist, The Johns Hopkins Hospital (personal communication) to the discovery that priapism in another case could be attributed to failure of the shut-off mechanism for the input of arterial blood into the penis, because it was relieved surgically by reducing the supply of arterial blood to the penis. Priapism is also attributed to blockage of venous drainage from the penis.

In priapism, the penis remains chronically engorged and erect, unable to become flaccid once the excess of blood in the corpora cavernosa of the penis thromboses. The organ becomes extremely painful. Eventually the corpora fibrose, losing all their spongy structure and capacity for tumescence. The penis becomes permanently unable to erect.

This condition occurred to both the patients in question. One of them, two years later, was still not able to achieve an erection. He became psychopathologically disturbed, almost to the point of paranoia. His sexual desire remained unchanged and, though mortified by his handicap, he tried to have intercourse. The mechanics of coitus were practically impossible to manage, but he had at times reached orgasm. He also had had nocturnal emissions, with a total estimated ejaculatory frequency of three times a week. The pleasurable feelings of sexual arousal and discharge, he said, had not changed. The other patient was able to have an ejaculation by means of manual manipulation. He once also tried fellatio and reached an orgasm. What he wanted above all, however, was to be able to have intercourse again, but his penis would not stay in the woman's vagina. Intensity and frequency of desire had not changed.

From the unusual cases reviewed in this section, it has appeared that orgasm, usually coordinated with other sexual variables, can occur when there is an hormonal deficiency, an absence of seminal fluid, or a failure of erectile potency. In the following sections it will be seen that orgasm can occur in the absence also of large segments of the external genitals.

GENITAL SOMESTHESIA: TACTUAL STIMULATION

Mistakenly generalizing from the fact that physical contact is a stimulus to tactual sensation, some theorists, notably Kinsey, Pomeroy, Martin and Gebhard (5) have spoken of tactual sensation as a physical, nonpsychologic phenomenon. Any sensation

is, of course, a psychologic phenomenon and, conversely, all sensory stimuli are in their way physical. Logically, then, the tactual sensations of sex are not fundamentally different from the visual, auditory or olfactory sensations. Pragmatically it makes sense, however, to distinguish sights, sounds and smells from tactual sensations. The first three come in through distance receptors, the fourth through close-contact receptors. Moreover, erotic sights, sounds and smells are either preliminary or peripheral to erotic tactual sensations, and the climax of eroticism, the orgasm, is itself a tactual and somesthetic phenomenon.

Tactual somesthetic sensation in a particular erotic zone or organ may be stimulated from an outside source, be it an object, another person or one's own limb. Somesthetic sensation may also be stimulated from within an erotic zone or organ in the absence of a demonstrable external agent. Practically nothing is known about the endogenous generation of erotic sensations and feelings in erotic zones and organs, nor what the internal stimulating agents, hormonal or otherwise, may be. Possibly stretch receptors play a part—in the distended prostate and seminal vesicles in the male, for instance, and in the vagina in the female.

REFLEX GENITAL FUNCTIONS IN PARAPLEGICS

In the intact body, local tactual stimulation and arousal within the genital and adjacent erotic zone cannot be investigated independently of cerebral and cognitional participation. Such is not the case, however, among accident victims whose spinal cords have been severed or crushed so as to render them paraplegic.

In paraplegia, the patient can feel and move absolutely nothing in the lower half of the body. The lower torso and limbs are anesthetic and paralyzed. They are also greatly withered owing to uncontrollable protein loss, and unduly subject to bed sores (decubitus ulcers) which can be prevented only by expert nursing care. Ordinary voluntary control over urination and defecation is lost. The literature on sexual functions in the paraplegics deals disproportionately with males, the injury being more frequent in males than females.

In paraplegic men, Kuhn (6) demonstrated the erection reflex as a response to local tactual stimuli. Tactual stimuli on and around the penis, extending perineally toward the anus and the inside surface of each thigh, were found capable of activating reflex arcs of the lower spinal cord and producing erection of the penis as a reflex response. Stimulation of erotic zones in the upper part of the body elicited no response in the genitals. Descending messages on the nervous system were blocked at the point of cord severance and not transmitted beyond that point. A patient was therefore unaware of what was happening to his genitals, unless he looked at them and in a very literal sense bridged with his eyes the gap in his spinal cord.

In like manner it is possible for a paraplegic to see himself ejaculating, though totally unaware of any somesthetic sensations of orgasm. The occurrence of ejaculation in paraplegics as a sequel to erection reflexly induced by manipulation, with or without coitus, is very rare, because coordination of the neural function of emission (sympathetic) and ejaculation (somatic) is so likely to be disturbed. This has been discussed by Bors, Engle, Rosenquist and Holliger (1); Talbot (12); and Zeitlin, Cottrell and Lloyd (13).

It is a point of further interest that the paraplegic, even though unable to manifest a reflexly induced ejaculation, may still be able to experience the subjective feelings of climax while asleep and having an erotic dream. This phantom orgasm in the dream happens without corresponding genitopelvic accompaniments (9).

CLITORECTOMY IN HERMAPHRODITES

Whereas the peripheral tactual receptors remain intact in paraplegics, while their

distant connections with the brain are broken, the peripheral receptors are destroyed in patients who undergo resective genital surgery. Genital resection, in the course of surgical reconstruction, is necessary in the management of certain cases of hermaphroditism (4). An enlarged clitoris of penis-like proportions is incompatible with complete femininity in the experience of the majority of hermaphrodites living as girls and women. They desire that their masculinized clitoris be amputated.

Such an operation is usually performed on female hyperadrenocortical hermaphrodites if they are to be reared as girls, or if they are already psychosexually established as females. For present purposes, the older patients with this adrenogenital type of hermaphroditism (Table 1 of Part I) are of particular interest. Before the introduction of cortisone therapy in 1950, these patients had undergone a precocious but virilizing puberty in early childhood, owing to the influence of an excessive supply of adrenal androgen. Under the impact of these androgens, the enlarged, unamputated clitoris was erotically very sensitive. At the same time, the vagina remained unestrinized and immature. In most instances the vaginal opening was congenitally misplaced within a urogenital sinus and needed surgical reconstruction.

Among seventeen older potential informants in this category of female hyperadrenocortical hermaphrodites, there were twelve who satisfied the triple condition: 1) they had been raised as girls and lived as women; 2) they were older than sixteen at the time of reporting on eroticism; 3) they had been clitorectomized and reported on their postsurgical eroticism.

The breakdown of findings in these twelve cases was as follows. In three cases no data on orgasm were disclosed. In four cases the data indicated the patient to be inexperienced in orgasm; only one of these women was married and she only had had intercourse—infrequently, it may be added. In five cases the evidence was the the patient had experienced orgasm: in two cases orgasm was masturbatory, in three coital.

The twelve women were all receiving cortisone at the time they reported on eroticism. There was no evidence, however, to suggest that orgasm might have been lost following clitorectomy only to reappear after hormonal feminization had been established under cortisone therapy, nor conversely that orgasm was lost under the influence of cortisone.

There is no ready explanation for the lack of orgasm in the four patients where such appeared to be the case. So far as could be ascertained from unstandardized operative notes, lack of orgasm did not correlate with amount of clitoral tissue removed, nor with any other surgical factor.

The point of these data on orgasm and clitorectomy is not, however, that some clitorectomized patients did not experience orgasm. On the contrary, the point is that the capacity for orgasm proved compatible with clitorectomy and surgical feminization of the genitalia in some, if not all of these patients. Erotically sensitive though it had been, the main body of the clitoris, including the glans of the clitoris, was dispensable with respect to orgasm.

PENECTOMY

It is logical to pass from cases of clitorectomy to cases of penectomy. Four patients with an amputated penis (Table 1) were asked about their erotic sensations and feelings. In all four instances, retention of the capacity for orgasm was reported, though in one the orgasm was emissionless as a result of radical surgery and occurred only in erotic dreams. Two of the patients had a postsurgical history of coital experience to make their reporting more informative. Segments of their interviews are quoted verbatim.

> One patient had the distal half of his penis amputated because of a malignant growth near the glans three years prior to being interviewed.

After the operation, he sired a son. The penile stump protruded about two inches in erection.

"You said a lot of the feeling in your penis is gone?", he was asked.

"Oh yea. It isn't like it was when I had the head on it."

"Do you have any feelings left in it at all, or is it just numb?"

"Oh no, there's plenty of feeling. Well—I imagine it's about as good as ever, except right on the end when I'm getting ready to have intercourse, see. I mean when I first get ready to have it, I don't feel if it's in or not, except that I know it's in, see. I got no feeling there at all—till after I get it in. Now after it goes in as far as it goes, well then I got perfect feeling then."

"Can you predict when you are going to come, to discharge?"

"Oh yeah!" Yeah, boy—then I've got so much feeling as I ever had. Yeah, I get as much feeling there as I ever did."

The other patient lost his penis at the age of thirty. The distal half was amputated, illegally, by a self-styled venereal specialist, and the remainder sloughed off, leaving only a useless stump. He was forty-two when interviewed. At this time he referred to erection and ejaculation retrospectively. Neither capacity had survived radical genitourinary surgery two years earlier for pelvic and scrotal abcessing and stricture of the urethra. The prostate was removed and the urethral orifice was relocated near the anus, requiring urination from a sitting position. The testes had atrophied, presumably as a result of so much local infection. The man was unusually fluent and spontaneous in recorded interviews, with anecdotes and descriptions of his sexual feelings and experiences.

"After you lost your penis, did you still have some sexual desires, to go with a woman, and some feelings down there, or did that change?"

"Oh sure! I used to look at a woman, and man! That old place down there would get so hard down there. Yes sir."

"Would it help any if you played with it with your own hands?"

"No. I could get up on a woman and if she would cooperate with me I could discharge."

"Oh, you could?"

"Sure. Yeah, I stayed with a woman a couple of years, like that. She taken a liking to me, you know, and I give her everything I could, you know. . . . The only thing she would have to get on top of me, you know. She would straddle me, you know, and I would be able to feel her all right, and all that heat down there."

. . . "And you would come to a climax and shoot off? Actually discharge some?"

"Yeah."

VULVECTOMY

It is roughly accurate to say that the female equivalent of penectomy is radical vulvectomy. An interview was obtained with two patients who had had this operation.

One patient, very deaf and difficult to interview, was post-menopausal at the time of surgery. Eleven years later, at the age of sixty, she considered she had had her day sexually, but because of her age, not her operation.

The other patient had been operated on fifteen years earlier. She had had epidermoid carcinoma of the vulva which entailed complete resection of the clitoris, labia majora, labia minora and the mucosa of the introitus. Inguinal and femoral lymph glands were also excised bilaterally. The patient was forty-five years old and still premenopausal when she returned, through the courtesy of Dr. Howard W. Jones, for an interview. She was very frank and spontaneous in talking about her sex life postoperatively. She said that, though she was still self-conscious about her genital appearance, so far as sexual feeling was concerned, there was no difference. "Oh certainly," she replied when asked if she could still reach a climax. She was definite that her breasts were the most sexually sensitive part of her body, if her husband wanted to arouse her. Answering an inquiry about sensation where the clitoris had been, she said, "That's all stitched up, all closed up." Through fear of injury, she guarded herself against love play in the area where the operation had been. Though she considered the area not lacking in sexual feelings, her preference was, as it always had been, for feeling the penis in her vagina. The feeling or orgasm occurred sometimes in dreams, she said. She quoted a dream. It was, like her daydreams, a compensation for the daily drudgery, an idealized romance with the perfect lover. In the dream they ended up having intercourse. She interrupted an inquiry about orgasm in the dream to affirm, "It's very clear."

Dr. Edward C. Mann, gynecologist and psychiatrist at The New York Hospital, reported in a personal communication that he has interviewed a woman of thirty who, like this last one, underwent radical vulvectomy without change of her capacity for

sexual pleasure and orgasm. She successfully delivered a child. Five postmenopausal women, older than 65, had no erotic changes after genital surgery but preoperatively their erotic activity had, owing to age, been nil.

SUMMARY

In paraplegia, genital arousal may be reflexly initiated locally by tactual receptors in the genital area and carried through to the completion of ejaculation despite the loss of cerebral and cognitional participation. In cases of extensive surgical resection of the genitals, erotic arousal may be initiated and carried to the completion of orgasm despite the loss of large zones of erotic sensory tissue, including the vulva or the penis itself. In cases of prostatic resection, it is possible for orgasm to occur without the emission of seminal fluid. In cases of postpriapism impotence, it is possible for orgasm to occur without erection. In eunuchism and hypogonadism, erotic arousal and climax may occur despite hormonal deficiency. Thus, among the coordinates of sexual function in the orgasm there are three: genitopelvic anatomy, the hormones and the brain, any one of which may fail in its contribution without total destruction of orgastic function. No one of the three can be said to be indispensable more than the others, except insofar as fertility is dependent on the gonads and their hormones. Nonetheless, it is self-evident that loss of any one of these three coordinates is an immense handicap to effective sexual functioning.

ABSTRACT OF PARTS I AND III

The sex hormones mature the body and thereby indirectly influence a person's social maturity. The level of sex drive or libido is hormonally influenced, and androgen is probably the libido hormone in both men and women.[4] The male and female sex hormones have a direct male and female effect respectively, on the genitalia, maintaining them erotically functional. The direction or content of erotic inclination in the human species is not controlled by the sex hormones. Hormonally speaking, the sex drive is neither male nor female but undifferentiated—an urge for the warmth and sensation of close body contact and genital proximity. Genitopelvic anatomy, the hormones and the brain are three coordinates of sexual function any one of which may fail in its contribution without total destruction of orgastic function. Tactual and other somesthetic signals relayed to the brain from the genitopelvic anatomy and from other parts of the body as well may have erotic significance and promote erotic arousal. Erotic arousal may be generated also by signals sent to the brain from the eyes, the ears and the sense of smell, which may be erotically just as potent as genitopelvic ones.

Signals other than genitopelvic ones become competent to release an erotic response, probably through a process of imprinting. In imprinting, a perceptual signal is matched to an innate releasing mechanism (IRM) which releases a behavioral pattern, in this case an erotic response. Imprints are established at critical periods in developmental history and thereafter are more or less permanent. Aberrations of sexual behavior may be explained as the chronic persistence of errors of infantile imprinting. Falling in love may be analyzed as a postpubertal example of imprinting.

[4] Additional strong support for this proposition has come to hand since Part I went to press, in the following publications.

SCHON, M. AND SUTHERLAND, A. M. The role of hormones in human behavior: III. Changes in female sexuality after hypophysectomy. J. Clin. Endocr., **20**: 833–841, 1960.

SOPCHAK, A. L. AND SUTHERLAND, A. M. Psychological impact of cancer and its treatment: VII. Exogenous sex hormones and their relation to lifelong adaptations in women with metastatic cancer of the breast. Cancer, **13**: 528–531, 1960.

WAXENBERG, S. E., FINKBEINER, J. A., DRELLICH, M. G. AND SUTHERLAND, A. M. The role of hormones in human behavior: II. Changes in sexual behavior in relation to vaginal smears of breast-cancer patients after oophorectomy and adrenalectomy. Psychosom. Med., **22**: 435–44[illegible], 1960.

The function of the brain in eroticism is primarily to coordinate and record signals that arrive *via* the different sense modalities. Messages so received may then be either inhibited, deferred or further elaborated as cognitional rehearsals until eventually they are transmitted in the service of genital erotic arousal. The brain may perform its cognitional erotic function independently of genitopelvic participation, as witness the dreams and daydreams of paraplegic patients whose pelvic genitalia function only through spinal reflexes and without any neural connection with the brain. The brain may record erotic signals and store them as memories for indefinite periods of time, so that life experiences may exert a continuing and even indelible influence on an individual's erotic inclinations and choices.

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PERSONALITY VERSUS INTOXICATION AS CRITICAL FACTOR IN ACCIDENTS CAUSED BY ALCOHOLIC DRIVERS

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The inimical relationship between alcohol consumption and automobile accidents has received considerable attention during the past three decades. It appears that beverage alcohol increases reaction time (2), impairs hearing (8), visual acuity (4, 6), and judgment. It is not surprising that its use appears to be intimately associated with both higher accident rates (10, 14), and fatal accidents (7). However, the metabolic union of alcohol and driver does not sufficiently explain why so many persons involved in traffic accidents have blood alcohol levels which indicate a considerable degree of intoxication. When a man smashes his car into an abutment while traveling at 90 miles per hour and it develops that he was inebriated at the time, does his intoxicated state adequately account for the accident? A number of studies completed during recent years point toward some answers and lay the groundwork for possible preventive measures in this complex field.

Until recently it was the *slightly* intoxicated driver who was held responsible for alcohol-associated accidents. The following is typical of the reasoning responsible for this phenomenon. "It is the slightly intoxicated driver who characteristically demonstrates impairment of judgment more than impairment in sensory functions or psychomotor responses who is the real threat to life and limb on the road." . . . . "The 'cockeyed drinker' constitutes neither a pedestrian nor driving problem. Most of these individuals are either too drunk to drive or to walk and hence sleep it off. The real problem, as has already been stated, is the slightly intoxicated individual who has drunk enough to impair his judgment but not to materially affect his appearance" (9). Authorities eliminated the possibility of the alcoholic being a traffic hazard by reasoning that he was either too drunk to drive or too crafty to expose himself to arrest. In view of recent studies unmistakably implicating the alcoholic, it is difficult to explain what appears to have been a universal oversight. A partial explanation might be that most studies on alcoholism prior to the last decade were conducted in state mental hospitals, skid rows, flop houses, and jails. The alcoholic inmates of these institutions probably had few automobile accidents for the good reason that they did not have the wherewithal necessary to acquire and maintain an automobile.

In 1955 Goldberg (5) reported on 1956 Swedish drivers convicted of driving while intoxicated. He was able to ascertain that 45 per cent of these men were alcoholics. Wilbar (15) disclosed that five per cent of 241 patients admitted to the Pennsylvania Department of Health Alcoholism Rehabilitation Center were convicted for driving while intoxicated over a four-year period. This compared with a conviction rate of 0.3 per cent in the total driving population of Pennsylvania during a similar four-year period. In a comparable study, a group of 98 alcoholics were compared with the general driving population of Ontario. This revealed that the alcoholics were involved in two and one-half times the number of accidents anticipated if compared with all drivers in Ontario. In addition they had nine times as many convictions for driving while intoxicated and six times as many license suspensions (13). The latter investigators also noted that almost all of the alcoholic group's statistically significant driving violations

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and accidents occurred when they were intoxicated. When sober their driving record was comparable to that of the general driving population. They therefore suggested that the traffic excesses of the alcoholic group were related "firstly to frequency of intoxication and alcohol consumption, and secondly to the physiological effects of alcohol *rather than to personality factors*" (italics added). Unfortunately the authors of this statement did not attempt to assess the personalities of the alcoholics whose driving records they analyzed. The question before us then is: does intoxication *per se*—even a greater degree of intoxication as an omnipresent finding—exclude the role of personality?

THE "ALCOHOLIC PERSONALITY"

Independent studies on the personality of presumed non-alcoholic, accident-prone drivers and the personality of alcoholics suggest that automobile accidents and the alcoholic personality are indivisible. Conger *et al.* (1) conducted an intensive study of ten young airmen held officially responsible for two or more motor accidents over a four-year period and compared them with ten airmen who had a record of no accidents during the same period. The study included psychiatric interviews and psychological examinations plus tests of interest, intelligence, physical skills, and physiological function. There were no differences found between the two groups in either intelligence or psychophysiological responsivity. In the area of personality functioning however, the accident repeaters displayed *poor control of hostility, less ability to tolerate emotional tension, greater dependency needs*, and extremes of both *egocentricity* and *fantasy preoccupation*. (As we shall see, many of these traits are independently ascribed to the alcoholic.)

Let us now turn to a clinical description of the alcoholic which was formulated without any thought given to the problem of automobile accidents (16). A number of characteristics attributed to the alcoholic may indicate that intoxication *per se* is not the only critical factor but may serve to release (driving) behavior which in turn expresses underlying psychopathology. The alcoholic is described as being basically *egocentric* and *self-centered*. This egocentricity may have the quality of an absolute conviction of *omnipotence* and *invulnerability*. One need not elaborate on the menace posed by an intoxicated individual with these characteristics seated behind the wheel of an instrument as potentially lethal as an automobile.

In addition many alcoholics are chronically *depressed*. A sense of hopelessness, loneliness, sadness, and futility is often present. The facade of joviality and gaiety which the alcoholic may wear bears no relationship to the depth of the underlying depression. A disproportionate number of suicidal gestures and attempts have long been observed in the alcoholic population. Psychoanalytic theory regards alcoholism itself as an unconscious form of self-destruction. Menninger has referred to alcoholism as "chronic suicide" (11). Glatt found that of 75 male alcoholic patients, 40 had felt at one time that it would be best for them to be dead, one-third had thought concretely of committing suicide and 25 per cent had actually tried to kill themselves (3).

Real proof of serious suicidal intent however can best be confirmed by "successful" attempts. A survey of all completed suicides over a one-year period in St. Louis revealed that of the total number of 134, at least 23 per cent (31) were alcoholics (12). (The automobile may serve as an ideal instrument of self-destruction, particularly for those who must hide their suicidal intent from others, and from themselves.)

Finally the alcoholic is said to be chronically *hostile*. Overtly destructive behavior is uncommon; the alcoholic often manages to express his aggressiveness in a passive, subtle way. Inebriety may change this however and his chronic rage coupled with a low frustration tolerance may erupt into violence. However the alcoholic is also a very passive, de-

pendent individual fearful of offending his dependency objects. The automobile may have great appeal to him as an instrument of almost socially-acceptable violence since he may be unable to display his anger in a less devious manner.

Three brief case histories will serve to point up not only the traffic hazard presented by certain alcoholic drivers, but also the fallacy of dicounting the role of personality. All three were recently treated as inpatients at the Veterans' Readjustment Center of the University of Michigan Medical Center.

Mr. A is a 28-year-old man who was admitted to the Veterans' Readjustment Center on February 19, 1960. He had been drinking excessively for several years and had recently been asked to resign from the United States Navy as a consequence of his drinking. Prior to this his wife had left him, taking their three children with her. Despite this the patient had only made one previous effort to seek help for his alcoholism; this occurred in 1958 when he attended Alcoholics Anonymous meetings for a few months. He relapsed however and resumed his consumption of approximately one pint of whiskey daily.

It was difficult to assess exactly why the patient had decided at long last to seek help at the Veterans' Readjustment Center. However, he stated that he realized that there must be "another way of living." He added that he had three children and he did not know how to contribute to their upbringing. Although he and his wife were separated, he had some contact with the children and a day before he came to the hospital he became angry at his six-year-old daughter over a triviality and had struck her so hard in the abdomen that she fell to the floor and was unconscious for a few minutes. This frightened the patient and probably precipitated his coming to the hospital the next day.

He stated that he drank because otherwise, "I constantly had a 'knot in my stomach.' " "I felt it made me more acceptable to other people and it pushed the worries away so that they didn't bother me any more."

The patient's driving history and attitudes toward driving were of particular significance. When asked what effect drinking had on him as a driver, he unhesitatingly replied, "It makes me feel that I cannot be outdone in an automobile. I feel this is something that I control completely. I can make it go fast or I can make it go slow but I never wanted to make it go slow. Drinking made my accelerator foot get heavy."

When he was asked if he tried to avoid driving when intoxicated, he replied, "The first thing I think of when I am drinking is to get into a car and drive the hell out of it." Later he said that the worst thing a person could do was to drive after drinking and then he added, "I know I shouldn't, but it doesn't seem to bother me a hell of a lot."

His driving accident history will of course come as no surprise. The patient's first driving accident occurred in 1948 when he was 16. He recalls none of the details but remembers having torn the fenders off his car and is certain that he had not been drinking prior to the accident. Two years later he smashed his car into the rear of a large trailer truck, totally wrecking the car and suffering a lacerated leg. This occurred at 2:00 A.M. and he had been drinking heavily for several hours before the accident. In 1951, when the patient was 19 years old, he ran his car off a road and smashed into some trees. He had been drinking heavily immediately prior to the accident. Later that same year he drove off an uncompleted bridge and was rendered unconscious for a brief period of time. The car was a total wreck. He had consumed a pint of whiskey during the preceding three hours. In 1960, the patient was traveling too fast for road conditions, again lost control of his car and damaged one side of it. He had been drinking heavily and did not bother to stop his car after the accident.

In addition to the above accidents, the patient has been ticketed or arrested for the following violations: nine times for speeding, once for running a stop sign, twice for passing in a no-passing zone, once for not having a driving permit, and once for driving while intoxicated.

This patient's impulsivity, chronic rage, and tendency to destroy himself through his driving make him almost a caricature of the "alcoholic personality" outlined above.

Mr. B was a 28-year-old skilled industrial worker who came to the hospital in the fall of 1959 because he had finally become frightened at some of the things his excessive drinking was doing to his life. He was especially concerned because he would awaken after his binges unable to remember much of what tran-

pired after he became intoxicated. However, he did know, primarily from information provided by friends and family, that he would very frequently be caught with a gun in his hand on his way to shoot someome he disliked. He remembered a few occasions when he would line his family up in the living room and threaten to kill them with his deer gun. He was deeply concerned over the fact that he was developing a very strong hatred for some of the policemen in his town and for the judge who had frequently sentenced him. He often ruminated about killing them, usually when he was intoxicated.

At one time during his interviews, the patient made the following statement. "Anger is so much greater when you are drinking. When you are sober you tend to overlook the same things that will make you angry when you are drinking. When you are drunk, you are angry at the world and you welcome a chance to hurt somebody in order to take out your anger."

When the patient was 17 he was arrested for reckless driving and received a light fine and a 20-day jail sentence. One year later he was again arrested for reckless driving and received the same sentence. He had not been drinking prior to either one of these offenses. In 1952 he was arrested for drunk driving while heavily intoxicated and received a $100 fine and 30 days in jail. In addition his license was suspended for three years, but this was returned to him six months later. In 1958 he was arrested for failure to have his car under control when he ran off a road and damaged his car. Later in 1958 he was arrested for permitting an intoxicated friend to drive his car. At the time the patient gave his friend the keys he was drunk and "not thinking." He again received a $100 fine, 30 days in jail, and a three years' suspension of his drivers license.

In addition the patient twice wrecked his car by running it off the road shortly after heavy drinking bouts. During the years 1947–1949 the patient owned a motorcycle which he wrecked on five different occasions during intoxicated periods, running it into culverts or ditches.

In addition to the traffic difficulty the patient has had, there was a history of four arrests for assault and battery, four arrests for disorderly conduct and disorderly fighting, and five arrests for drunk and disorderly behavior. He had also served two prison sentences for breaking and entering. All of these offenses had occurred when the patient was intoxicated.

In discussing his driving while intoxicated the patient stated that "when you are drunk, you get in a carefree mood and you figure 'if I get killed, I get killed' ".

This individual's behavior when drunk illustrates the underlying chronic hostility present in many alcoholics. When sober he had little difficulty in controlling his aggressive impulses. Once he became addicted to alcohol a vicious cycle was set in motion that could only be interrupted by treatment. Had this man's alcoholism been perceived early in the long list of his offenses, and if the court had used its authority to force him to seek treatment, his delinquent history may have been shorter-lived. His history of repeated transgressions points up the futility of attempting to resolve or curb the problem by the usual judicial methods.

The third patient is something of an exception—but an exception that emphasizes the potential menace of some alcoholic drivers.

Mr. C was a 35-year-old federal employee admitted to the Veterans' Readjustment Center in January, 1960. Although he realized that he was alcoholic and could not stop drinking, he had never really made any sincere effort to seek help on his own. In 1955 he did seek treatment at the Detroit Clinic for Alcoholism when pressured into this by relatives. After two visits to the Clinic he did not return. Later that same year, again "to make my relatives happy," he attended five Alcoholics Anonymous meetings. However he felt that these "did nothing for me—I didn't feel right being there."

On the occasion of his present admission, the patient's seeking treatment was precipitated by the forceful coercion of his supervisor. The supervisor informed the patient that he must seek treatment in order to retain his job. The patient felt that if he lost his job, he would drink even more. Another reason he gave for seeking treatment was the fact that he was becoming increasingly *depressed*. Originally he had attempted to ward off his depression by drinking. He stated, "After a while I didn't need a reason. I just felt better when I was drinking—everything was better. It was like seasoning on food. Life was drab and drinking made things tolerable. I didn't feel that I fitted in and it helped me not to think about my feeling different from other people. A bottle

was a sanctuary where you could escape and you needed no qualifications to go in and order a drink."

At the time of his first interview, the patient appeared quite despondent. He acknowledged that he occasionally had fantasies of doing away with himself. In 1957 while heavily intoxicated he made a determined effort to get hit by a car. He ran out on the road several times as cars were coming but the drivers managed to avoid him. Friends finally discovered him and dragged him away. In November, 1958, he was "accidentally" hit by a car after a drinking bout. He walked into the street from between two parked cars and sustained a skull fracture.

When queried about his driving history, the patient revealed he had never held a driver's license. When asked the reason for this, he replied, "I am afraid that I would kill myself or someone else. My past performance in a car showed me that I should not drive. When I get in a car, I feel it should go as fast as I desire it to go." He was then asked to describe his previous driving experience. He related that he had only driven a car on three occasions in his life. He was intoxicated each time and in each instance he put the accelerator to the floor board and left it there. In addition, he recalls driving most of the time on the left hand side of the road and "taking every chance in the book." His underlying hostility was well expressed when he said, "if I drink again, I'd want nothing to do with an automobile. My first fear is hurting someone else and having it on my conscience."

In this patient, the elements of depression, self-destruction, and underlying aggression can be readily perceived.

DISCUSSION

The alcoholic is described as having underlying feelings of omnipotence, invulnerability, chronic rage, depression and self-destructiveness. To this can be added the effect alcohol has on driving ability and judgment—and one can appreciate the need to further investigate and rehabilitate the alcohol-addicted driver.

Is it not likely that someone with these personality traits might behave differently when driving while intoxicated than an intoxicated driver who did *not* have these personality characteristics? Although both drivers would represent a greater highway hazard than a sober driver, one suspects there is a greater probability that those alcoholics who have the above personality structure would become involved in a motor vehicle accident. A pint of whiskey can do many things but it cannot drive a car.

In view of the foregoing, it appears likely that a substantial number of motor vehicle accidents are caused by alcoholic persons. (It is also possible that many persons arrested for driving while intoxicated are alcoholic.) In view of their inability to stop drinking unaided, they represent a unique challenge in that they offer law enforcement agencies an unusual opportunity to *prevent* future accidents at the hands of the *same* potential offenders.

SUMMARY

The inimical effect of beverage alcohol on the operator of a motor vehicle is well known. Recent studies implicate the *alcoholic* rather than the casual drinker as a major contributor to the traffic accident problem. The alcoholic's more frequent and greater degree of intoxication, however, does not sufficiently explain his more frequent involvement in automobile accidents. The alcoholic's drinking often releases behavior motivated by underlying personality traits that result in serious accidents or traffic law violations. These traits have been variously described as chronic hostility, depression, self-destructiveness, and feelings of invulnerability and omnipotence. One can readily perceive the menace posed by an intoxicated individual with these characteristics seated behind the wheel of an instrument as potentially lethal as the automobile. Three case histories are presented which indicate that the alcoholic's personality may play as important a role in his automobile accident involvement as his intoxication. The case histories emphasize the futility of present judicial methods of dealing with alcoholic traffic offenders as manifested by failure to

prevent repeated accidents and violations involving the same offenders. The courts either send the alcoholic offender back into the community with admonitions that his illness makes it impossible for him to heed—or by punitive action which fails to rehabilitate him. In either case the community is again exposed to his potential motor vehicle depredations. Treatment rather than futile punishment may provide an answer to what may well be a serious and widespread public health problem.

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MAZE PERFORMANCE AND FIXATED BEHAVIOR IN THE RAT AFTER CRANIAL X IRRADIATION

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There has now accumulated a body of scientific literature giving considerable account of what behavioral deficits should be expected when mammals are subjected to irradiation with wavelengths beyond the ultraviolet (3, 5). Harlow (4) studied the effects of X irradiation and cosmic irradiation in monkeys above 90,000 ft. Most of the studies have been concerned with behavioral changes following whole-body irradiation though Blair (1) and Blair and Arnold (2) confined the irradiation to the head. Their studies dealt with acquisition and retention of a learned maze performance. This study was designed to study the effect of X irradiation to the brain of rats on maze learning, and on the rate of acquisition and extinction of fixated behavior. The fixations are somewhat of the Maierian type though we used the T maze whereas he had a jumping stand.

METHOD

Fourteen experimental and 16 control laboratory rats, Sprague-Dawley strain, were anesthetized and the experimental *Ss* X irradiated with a total of 1760 roentgens (R). The rat's cranium was suspended in the beam cross sectionally shaped by lead shields for optimum and controlled exposure. The skull of the rat was divided into four equal parts and one of the areas was treated at a time. The other three areas were protected by an adequate lead shield. A water-cooled Phillips Microradiographic Unit with a molybdenum target was used. The factors employed were: no filter; 50 KV; 10 MA; 70 cm. TSD (target skin distance); 88r per minute output in air; 20 minutes time. The per cent dosage as determined by the use of a Victoreen R meter and a paraffin phantom of the average size of the skull of the animals used for the study was 78 per cent just within the skull on the cortex of the brain and 25 per cent at the center of the brain. Next, the eyes of all rats were removed.

TESTS AND PROCEDURE

Ninety days postirradiation, all Ss were given learning trials, one per day, in a modified Stone 14 choice-point multiple T maze for 27 trials. Twenty days rest were introduced between trial 27 and 28 with an apparently well established plateau. The learning test was stopped at trial 32. Approximately 23½ hours daily water deprivation was utilized with 30 seconds drinking in the goal box serving as the reinforcing agent. Retracing was always permitted. Following the learning trials, all *Ss* were run in a single unit T maze with water available at the end of only one arm of the T randomly up to 40 trials. For the remaining 220 trials, the trunk of the T was electrified always and one arm was electrified randomly and gradually up to 55 volts with a variable auto transformer and water was no longer available. Thus each trial the *Ss* ran down an electrified trunk and randomly into an electrified or nonelectrified arm of the T in avoidance type learning. Fixations similar to those obtained by Maier resulted by this procedure. These fixations were then systematically extinguished by reinforcement with water opposite from the fixated side for each *S* and by blocking the entrance to the arm of the T to which the animal had repetitively gone, *i.e.*, to which he had become fixated. These blocks always occurred on the middle trial of daily groups of three.

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RESULTS

The gross reactions of the *Ss* to the 1760 R were not remarkable and compared with expectations as reported in the literature consisting for the most part in several days of lethargy and drowsiness followed by gradual return toward usual behavior. Five *Ss* died during the anesthesia procedures, leaving 10 irradiated and 15 controls. Figure 1 shows the learning performances on the modified Stone 14 choice-point T maze. Note that the groups do differ in errors committed in the region of relatively high performance levels between trial 13 and 32. Using the Mann-Whitney U Test, this difference is reliable between the .05 and .01 level of confidence. It is clear that in the region of fastest learning no difference exists.

Figure 2 gives a comparison of the fixation acquisition rates for the *Ss*. Only chance divergencies occur in the graph. The actual measure is the mean number of changes of direction of turn per rat at the choice point during a 20-trial region. The fixations were broken in twenty unguided trials with one guided trial interspersed between each two unguided trials. A Wald-Wulfowitz Runs Test and inspection of the data leave no doubt that the rates of extinction are not different between the control and irradiated animals. Gross histologic examination of the brains of two experimental animals approximately 12 months after irradiation showed no lesions of either the nervous tissue proper or of the vessels. Differences observed in the behavior of the two groups is not attributable to brain damage that can be recognized by the usual methods of histopathological technique.

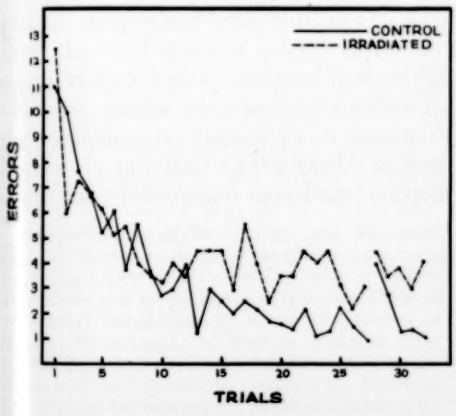

FIG. 1. Mean errors per trial.

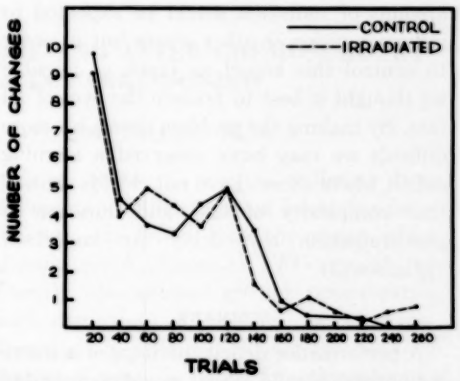

FIG. 2. Mean changes during each twenty-trial period.

DISCUSSION

One would expect to find diffuse but minimal histologic change three months after 1760 roentgens have been absorbed in a rat's brain. We believe our learning data indicates this mild deficit. We had also expected that fixations of the type obtained with random reinforcement and avoidance type responses would be acquired and extinguished at a different and perhaps slower rate since inflexibility often accompanies organic brain damage. We can only conclude that: 1) mild brain damage of this type is not a serious factor in fixation development and extinction, 2) the mild brain damage did impair maze performance, 3) slightly impaired intellectuality is not an important factor in fixation development, and 4) vision is not important for fixations of this kind. This is consistent with the compulsive nature of this type fixation and with T maze performances after irradiation (3). We are not sure that this

amount of radiation would be expected to influence vision or other senses but in order to control this aspect as much as possible we thought it best to remove the eyes of all rats. By making the problem thus a bit more difficult we may have observed a learning deficit where others have not. Fields showed that complexity of task and duration of postirradiation test delay are important variables (3).

SUMMARY

A performance deficit, perhaps of a learning nature, of mild extent was demonstrated subsequent to 1760 roentgens irradiation to the cranium of 10 rats as compared to 15 controls. A 14 choice-point Modified Stone Multiple T maze was used and all rats were blinded. Acquisition and extinction rates of fixation development in a single unit T maze were essentially the same for both groups.

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VISUAL MOTOR PERFORMANCE BEFORE AND AFTER CHEMOSURGERY OF THE BASAL GANGLIA IN PARKINSONISM

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It is the primary purpose of this report to present immediate and long range postoperative findings on a visual motor test for a series of patients who underwent chemothalamectomy and chemopallidectomy for the relief of Parkinsonian tremor and rigidity (7, 8). In addition, data will be presented on certain pertinent preoperative and operative variables which may relate to such changes. Finally, it is proposed to explore relationships which may exist between aspects of the preoperative neurological status of the individual and functioning on such a test. The data to be reported here are based upon the Bender Visual Motor Gestalt test, and represent part of a continuing series of studies on the psychological effects of chemosurgery (18, 19).

BACKGROUND

Since first described as a clinical instrument (3), the Bender Gestalt test had become an increasingly useful technique for the study of certain aspects of behavior. Clinicians have found it to be particularly effective as a relatively simple and rapid method for the gross assessment of brain functioning and the diagnosis of brain damage (11, 15). Both the reliability and validity of the instrument have been investigated in some detail, with special reference to its utility in the evaluation of "organic brain damage." Barnes (2), in validating the Bender against electroencephalographic recordings, utilized a large series of patients suffering from epilepsy and other forms of brain disease or damage. He found that the group which demonstrated abnormal EEG's most frequently also showed greater perseveration and distortion of designs on the test. Bowland (5) obtained Bender records from groups of normals, neurotics, schizophrenics and organics. Statistical analyses of objective scores revealed the differences between all of the groups to be reliable to a high degree of significance, the largest differences obtained between normal subjects and organic patients. In a carefully controlled comparison of Bender reproductions for a brain-damaged and matched psychiatric group, Mark and Morrow (13) found that seven of nine objective scoring categories differentiated the groups with a probability of below .01. Shapiro *et al.* (22) report that elderly brain-damaged psychiatric patients copy angles of Bender figures significantly less accurately than do non-brain-damaged elderly psychiatric patients.

In further investigations of visual motor performance in brain pathology, Hanvik and Anderson (10) studied individuals with lesions in either the left or right hemisphere. They found no significant difference in performance between the hemisphere groups but noted that brain-damaged individuals demonstrated a greater tendency to rotate the figures than normal controls. Guertin (9), in evaluating 27 males with clear evidence of various types of organic brain disease, was able to differentiate three types of organics, the first group having emotional instability, the second spatial disability, and the third tending to restrict their functioning and demonstrating feelings of inadequacy. As part of a series of studies on the effects of LSD-25, Abramson *et al.* (1) ad-

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ministered the Bender to 25 normal subjects. They found that the mean scores of this group, when given 50 and 100 microgram doses of LSD-25, changed a significant amount in such a direction "as to resemble more closely the scores of psychiatric in-patients and out-patients." Nebuhn and Cohen (14) utilized the Bender in a multiple-choice memory type study and found marked differences in perceptual accuracy between normals on the one hand, and groups of acute schizophrenics, chronic schizophrenics, and neurologically diseased on the other hand. The neurologic patients were least proficient on the test.

In summarizing a series of previous investigations utilizing the Bender-Gestalt in studies of organic brain damage, it would seem reasonable to conclude that the test is essentially reliable and valid in differentiating many groups of brain-damaged and brain-diseased from normal populations. The evidence clearly suggests that brain lesions tend to disturb visual motor performance as measured by the test.

POPULATION AND PROCEDURE

The population consisted of 54 adult Parkinsonian patients who underwent chemosurgery and had the Bender Visual Motor Gestalt test administered to them preoperatively, within three weeks postoperatively and in a follow-up evaluation. They constituted a consecutive series of patients, and thus include a randomly selected group which can be considered representative of the total population of patients who have undergone the neurosurgical procedures under consideration. The group consisted of 30 males and 24 females whose mean age was 51.8 years. The mean length of illness was 7.1 years with a range of two to 18 years. In Parkinsonian symptomatology, the group ranged from mild and unilateral to bilateral and advanced. Their education ranged from four to 20 years, with a mean of 11.2 years. Patients who scored as borderline or defective on intelligence testing, who had a history of mental illness, or who were judged on preoperative psychological tests to be psychotic or "organic" were eliminated from the study. Only individuals who underwent unilateral operations were considered. A separate study concerning the effects of bilateral surgery is now in progress. Forty-nine of the group were predominantly right handed, *i.e.*, left hemisphere dominant.

Each patient had the Bender-Gestalt test administered to him within three to seven days prior to surgery. For the total group, the median preoperative time was four days. The test was administered individually according to conventional practice (4). Usually between two and three weeks subsequent to surgery, depending upon the overall clinical condition of the patient, a postoperative test was given. For the group, the median postoperative time was 16 days. Long range testing was carried out a median of ten and one-half months postoperatively, with a range of four to 15 months.

The objective scoring of the test was carried out according to methods previously described by Pascal and Suttel (16), with certain modifications to make it more appropriate for the Parkinsonian population, *e.g.* allowances were made for the effects of symptoms on writing ability. Each design was first rated on a three-point scale, based upon the accuracy of the individual reproductions. The total points thus achieved was referred to as the accuracy score. In addition, a configuration score, based upon the integration of the pattern of designs, was calculated. In both the accuracy and configuration scores, the numerical rating was inversely related to the quality of the performance. Accuracy and configuration score were rated without regard to impairments which might reasonably be attributed to influence of tremor or rigidity on performance. Finally, measurements were taken of the vertical and horizontal dimensions of both the circle and diamond on the first design, and a rating was made for compression score in each configuration, *e.g.*, compression

was scored whenever the total configuration of designs fit into half a standard page or less.

In addition to comparing preoperative, postoperative, and long range scores on the test, the following variables were evaluated in order to determine their relationship both to the preoperative Bender and to the various postoperative changes: age, sex, length of illness, education, mean tremor, mean rigidity, voluntary movement impairment (VM), autonomic nervous system impairment (ANS), clinical rating of candidacy for surgery, and preoperative mental impairment. Statistical comparisons in all instances were carried out through the use of chi-square analyses or the Wilcoxon Test (23). Pertinent history and neurologic data were culled from the neurological and neurosurgical records. Data regarding the site of the lesion were derived from methods previously described by Bravo and Cooper (6).

Two sets of control data were utilized, as follows.

1. The first group consisted of eleven Parkinsonians, matched with the control group on sex, age, length of illness, and other pertinent variables, but who did not undergo surgery. This group had the Bender-Gestalt administered to them twice with a mean time interval of three weeks. While certain individual cases demonstrated changes in the scoring categories utilized in this investigation, the mean group scores were essentially equivalent for both test administrations.

2. A group of seven Parkinsonians, again matched with the experimental group on pertinent variables, had the Bender-Gestalt test administered to them with a mean interval of approximately nine months. In this instance also there were no significant mean changes for the pertinent scoring categories.

One might thus characterize the control group data as indicating that when the Bender-Gestalt test is administered to Parkinsonians with intervals of three weeks and nine months, no significant changes occur in group scores for the categories under consideration, although in individual instances changes are present. Additional control is inherent in the nature of the research design. First, each patient in essence was compared with himself in the immediate, postoperative, and long range testing. Secondly, on all test variables the left and right hemisphere operates were contrasted, each serving as control for the other.

RESULTS

THE PREOPERATIVE SITUATION

To determine the relationships which may exist between certain aspects of the patient's life situation, his neurologic and mental condition on the one hand, and preoperative performance on Bender-Gestalt variables on the other hand, chi-square analyses were made. For the ten variables previously enumerated, the population was divided into high and low groups as based upon the median scores. The upper and lower halves were then compared on accuracy and configuration rating for the Bender, and dimensions of the circle for the design A. Table 1 summarizes the statistical findings.

The most apparent and reliable differences between the high and low groups for the ten variables under consideration occur in the Bender accuracy score. Perhaps the most pertinent findings are in the areas of symptom severity and mental impairment. In the categories of tremor, rigidity, voluntary movement impairment, autonomic nervous system impairment, and mental impairment, the groups with the greater involvement are consistently and significantly worse in their accuracy performance. Similarly, those demonstrating the greater length of illness show poorer performance in this area. Finally, sex seems to be a differentiating factor in that the male group has somewhat better accuracy scores than the females.

Other findings of interest occur in the configuration score: here the older group's per-

TABLE 1

The Relationship of Preoperative Variables to Preoperative Bender-Gestalt Performance (N = 54)

	Sex	Age	Length	Educ.	Tremor	Rigidity	V M	ANS	Clinical Rating	Ment. Imp.
Vertical* Dimension of Circle	$p \leq 0.02$ Males larger	NS†	NS	NS	NS	NS	NS	NS	NS	NS
Accuracy Score	$p \leq 0.05$ Males perform better	NS	$p \leq 0.01$ Short duration perform better	NS	$p \leq 0.01$ Low T perform better	$p \leq 0.01$ Low R perform better	$p \leq 0.01$ Low V M perform better	$p \leq 0.01$ Low ANS perform better	NS	$p \leq 0.01$ Low M.I. perform better
Configuration Score	NS	$p \leq 0.01$ Young perform better	NS	NS	NS	NS	NS	NS	NS	NS

Table based upon chi-square analysis.
* The horizontal dimension on the circle revealed no significant differences.
† Not statistically significant.

TABLE 2

Comparison of Preoperative and Immediate Postoperative Bender-Gestalt Scores (N = 54)

	Circle		Diamond		Accuracy	Configuration
	Vertical	Horizontal	Vertical	Horizontal		
Total Group (N = 54)	NS*	NS	NS	NS	NS	$p \leq 0.02$ Performance Worse
Left Hemisphere (N = 19)	NS	NS	Trend† Increase	Trend Increase	Trend Better	NS
Right Hemisphere (N = 35)	NS	NS	NS	NS	Trend	$p \leq 0.001$ Performance Worse

Table based upon Wilcoxon Test.
* Not statistically significant.
† $0.2 > p > 0.05$.

formance is significantly poorer than that of the younger group. In the vertical dimension of the drawn circle there is a significant tendency for the male group to show greater height in their drawings. There were eight instances of preoperative compression, four patients of whom reflected primarily left body involvement and four demonstrating predominant right body involvement. Finally, there were no significant differences in mean size of Bender productions when the predominantly left symptom group was contrasted with those having greater symptomatology on the right extremities.

IMMEDIATE POSTOPERATIVE RESULTS

Table 2 summarizes the immediate postoperative results for certain pertinent Bender variables for the total group, and for left and right brain operates separately.

The data of Table 2 reveal a significant change only in the configuration score, where postoperative performance deteriorated. Furthermore, the change is reflected essentially by the right brain operates, there being no apparent change in the score for the left brain group. This is further demonstrated when a direct chi-square comparison is made between the left and right brain

roups on configuration score; here the difference is found to be statistically significant. his finding takes on added importance since atistical comparisons between left and ght brains on the site and size of the lesion veal no significant differences.

Certain trends are present in the immediate postoperative test situation, though not aching statistical significance. Specifically, he right brain operates tend to worsen mewhat, whereas the left brain group nds to improve. Furthermore, there is a ight indication that the left brain group increases in overall size of the diamond during the immediate postoperative situation. Compression occurs during this situation for three of the left brain group and twelve of the right brain group. Finally, no significant differences are found when thalamic and non-thalamic lesions are compared, although there is a slight tendency for patients with larger lesions to perform worse in both accuracy and configuration when tested immediately postoperatively.

When the ten previously enumerated preoperative and operative variables are assessed to determine their relationship to immediate postoperative changes in Bender variables, only two areas reach a statistically significant level. These are mean rigidity, in which patients with higher preoperative involvement tend to decrease more in the immediate postoperative situation in accuracy ($p \leq .04$); and autonomic nervous system impairment, where those with higher preoperative involvement likewise tend to show greater deterioration in immediate postoperative accuracy ($p \leq .03$).

LONG RANGE RESULTS

Table 3 summarizes the long range postoperative results on certain pertinent Bender variables for the total group, and for left and right brain operates separately.

There are statistically significant changes in size of both the circle and diamond, reflected primarily by the right brain operates. When the left and right brain groups are compared directly with each other on these variables, differences are short of significance, but certain trends are quite suggestive. In the configuration score, the left brain group shows significant improvement in performance during the long range situation, whereas the right brain operates evidence no apparent change in this area. Four left brain patients are found to demonstrate compression of designs in the long range situation, while fifteen right brain operates do so. The tendency, therefore, is for right brain operates as a group to increase in mean size of the figures, but also to reveal more individual instances of compression in their performance.

The site of the lesion does not show any long range significance when thalamic and

TABLE 3

Comparison of Preoperative and Long Range Postoperative Bender-Gestalt Scores ($N = 54$)

	Circle		Diamond		Accuracy	Configuration
	Vertical	Horizontal	Vertical	Horizontal		
Total Group ($N = 54$)	NS*	$p \leq 0.01$ Increase	$p \leq 0.0018$ Increase	$p \leq 0.046$ Increase	NS	NS
Left Hemisphere ($N = 19$)	NS	NS	NS	NS	NS	$p \leq 0.05$ Performance Better
Right Hemisphere ($N = 35$)	$p \leq 0.04$ Increase	$p \leq 0.02$ Increase	$p \leq 0.014$ Increase	$p \leq 0.06$ Increase	NS	NS

Table based upon Wilcoxon Test.
* Not statistically significant.

non-thalamic lesions are contrasted. However, patients demonstrating larger lesions perform significantly poorer in configuration ($p \leq .05$), and tend to have lower accuracy scores. Finally, none of the preoperative variables previously enumerated seem to be pertinently related to long range postoperative changes on any Bender variable.

DISCUSSION

The preoperative situation revealed certain patterns of correlation between the Parkinsonian's neurologic status and visual motor performance which merit comment. Most noteworthy was the high positive relationship between symptom severity and mental impairment on the one hand, and impaired visual motor performance on the other hand. This finding is generally compatible with those of Barnes (2) and Niebuhn and Cohen (14), both of whom reported deficits in visual motor performance in the neurologically diseased individual when contrasted with suitably matched normal controls. It now seems probable that not only are the neurologically diseased (Parkinsonians) impaired in this function, but that this impairment increases in relation to the degree of overall neurologic and mental symptomatology. This tends to confirm and broaden our previous concepts concerning the positive relationship between advanced neurologic involvement and impairment in various modes of higher integrative functioning in the Parkinsonian (17). Two possible explanations seem tenable concerning the brain mechanisms involved. Since the pathological lesions in Parkinsonism are considered principally to include the basal ganglia and brain stem (25), one might hypothesize that such lesions may eventually affect higher order behavior by disturbing the projecting fiber tracts or circuits between these areas and various cortical structures. Second, it is possible that progression of the disease itself may eventually directly affect the neuronal structure of the cortex, and thus result in impedance on this level and finally in the observed mental symptoms. However, our present data and research instruments are not sufficiently refined to permit even a tentative resolution of the problem; further inquiry is clearly indicated. Moreover, it is quite likely that the recently described diffuse brain stem and basal ganglia afferent reticular systems play a significant role (12, 20) in the mechanism.

The most notable finding during the immediate postoperative situation is the worsening on configuration score, reflected primarily for those operated upon for the right hemisphere. Moreover, this group shows a slight tendency to regress in its accuracy performance. The failure for either the site or size of the neurolytic lesion to be significantly different for the hemisphere groups or to be correlated with postoperative change adds further weight to this observation. It would not appear unreasonable to conclude that the right hemisphere might more closely be related to those neural mechanisms which are involved in visual motor performance. Further credence is given to this viewpoint by the fact that right brain operates were not affected in any apparent way in coordination, motor, or writing ability for the right extremity. Finally, this finding is in conformity with previous data reported by ourselves and others concerning possible differential aspects of function between the hemispheres (18, 19, 21). One contrary report in this regard was made by Hanvik and Anderson (10), who found no statistically significant differences on any of the Bender variables when dominant and non-dominant hemisphere lesion groups were compared. However, these investigators apparently administered the test essentially as a recall instrument, a factor which may account for their lack of positive findings.

In the long range assessment the right brain operates are found to return essentially to their preoperative level in both configuration and accuracy score, thus establishing the transient nature of the immediate

postoperative changes. On the other hand, the left brain group demonstrates significant improvement in configuration score. This is not unexpected, since the majority of this group evidenced improved overall motor function on the right extremity as a result of neurosurgical intervention. This, in turn, is probably reflected in more efficient visual motor performance.

Of further interest in the long range situation is the trend for the right brain group to increase in mean size of the initial productions, whereas the left brain group remains essentially unchanged. Moreover, for the right hemisphere operates, many more individuals demonstrate compression of design. The pattern is thus toward a mean or group increase in size of productions contrasted with a greater individual tendency for constriction in performance, suggesting a wider variability of reactions in visual motor performance for those individuals subjected to right hemisphere lesions. Recently, Teuber (24) reported that certain sensory deficits of the left extremities may be due as much to left hemisphere lesions as to damage of the right hemisphere, whereas such deficits on the right extremities were more likely related to contralateral parieto-temporal lesions. Our data may tend further to affirm the possibility of a wider distribution of behavioral effects for lesions of the right hemisphere. Whether this is a more general phenomenon must await further investigation.

SUMMARY

In summary, the Bender Visual Motor Gestalt test was administered to 54 Parkinsonians before and after chemosurgery, and in a long range follow-up assessment. The group represents a consecutive sample of patients undergoing chemothalamectomy and chemopallidectomy, and thus can be considered representative of the group who have undergone this procedure at St. Barnabas Hospital. The test was evaluated according to methods described by Pascal and Suttel, with certain adaptations to make it more appropriate to the Parkinsonian population. In the preoperative situation there is a high positive correlation between symptom severity and mental impairment on the one hand and impaired performance on the Bender-Gestalt on the other hand. Immediately postoperatively those undergoing surgery for the right hemisphere worsen in their overall performance, while the left hemisphere group shows no apparent changes. Long range scores reveal a return to preoperative functions for right hemisphere operates and improvement in overall performance for the left hemisphere group. The former group, moreover, demonstrates a mean increase in size of reproduction, although many individuals are found to compress their designs.

The preoperative results were interpreted to indicate that in Parkinson's Disease neurologic, mental and visual motor deficits are closely correlated. It was further suggested that results derived from the immediate and long range postoperative performance indicate differential functions for the hemispheres. An hypothesis was proposed that in visual motor performance, as evaluated by the Bender-Gestalt test, the right hemisphere plays a more significant role, first as concerns the neurophysiologic bases for this activity, and second because post-surgical changes for this hemisphere group were more variable.

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ROLE CHANGING APTITUDE AND RECOGNITION OF HUMAN IMAGES IN HYSTERICS: A PRELIMINARY STUDY

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INTRODUCTION

Using experimental techniques, Eysenck (1–3) defined the normal-neurotic continuum as one of the basic dimensions of personality, and suggested that the location of each person on a point of this dimension would correspond to the amount of his neurotic maladjustment. The extraversion-introversion continuum, independent of the former one, would determine the clinical form of the neurosis. Marked introverts would present dysthymic neuroses (with depressive symptoms or anxiety), and marked extraverts would show hysterical neurotic reactions. Some years later, Eysenck (4) related this second descriptive dimension, extraversion-introversion, to an explanatory hypothesis based on some properties of the central nervous system in connection with the capacity for conditioning and learning. Franks' (5) experimental studies have demonstrated difficulty for acquisition and facility for extinction of conditioned reflexes in hysterics; dysthymics on the contrary, are easily conditioned and their responses extinguish slowly.

Eysenck (4) has established a relationship between the clinically observed poor socialization of hysterics and their assumed difficulties in the childhood learning situation. But a study of the clinical manifestations of the hysterical personality and its relationship with some simple experimental situations, such as the retention of human images, has not yet been attempted.

Histrionism is a psychological characteristic classically ascribed to hysterical personality, and one of its aspects can be described as a facility for taking other persons' roles and changing from one of these roles to another.

Mann (9) divides the publications about role-playing into two groups: the publications which use the method as a procedure for evaluation of the personality (6, 11, 12) and the ones which apply role-playing as a technique for inducing personality changes (7, 8). A controversial aspect of the subject lies in the variety of concepts used by the different authors. In everyday language, a role is the part in a play which is performed by each actor. Enlarging this concept, we think of the term role as the part each individual plays in society (10). According to this notion, the individual role enactment depends on two groups of factors; on the characteristics the social group assigns to the role (role-expectations) and on the other hand, on the peculiarities of the individual who enacts the role. Furthermore, the individual's role-taking aptitude must also be considered (13), as well as his role-changing aptitude, which is the subject for study in the present paper. We take the position that role-changing aptitude is the capacity for shifting from one to another in the election of other persons' roles, through a voluntary decision of the patient. Role-changing aptitude would be related to the patient's histrionism level and in general to the intensity of the hysterical character as described by the clinical method.

Our first working hypothesis, on a descriptive level, may be formulated as follows. *The level of role-changing aptitude is higher in patients with hysterical personality, than with non-hysterical neurotics.*

On the explanatory or causal level, several hypotheses may be considered. Our aim has

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been to explore the contention that hysterics have a reduced capacity for conditioning and learning. Hysterics would have a poor retention of sensory stimuli; on the other hand, the adoption of another person's role must be attained using sensory impressions the patient takes from his model. We may suppose then that among the factors that can facilitate the passage from one model to another would be the insufficient immediate retention and delayed recognition of the model's sensory image, particularly in its visual aspect.

The second working hypothesis, on the explanatory level, may be stated briefly as follows. *The capacity for immediate retention and delayed recognition of human visual images is less in patients with hysterical personality, than with non-hysterical neurotics.*

SUBJECTS

The *Ss* were 64 female patients from the outpatient section of the Psychiatric Clinic of the University of Chile, in Santiago. Their ages ranged from 18 to 40 years; intellectual level was within normal limits as estimated by the Similarities and Block Designs subtests of the Wechsler-Bellevue Scale. *Ss* had normal visual acuity and no previous training with photographic material. Most of the patients were of lower middle class backgrounds. All of them were diagnosed as neurotic, without any other concomitant psychiatric diagnosis. Through a detailed analysis of each case, the following groups were formed. 1) *Unmixed hysteric group*: *Ss* with clearcut hysterical character traits with or without other hysterical symptoms but free from other kind of neurotic trouble (18 patients). 2) *Mixed group*: *Ss* diagnosed as symptomatic and/or character neurotics presenting hysterical as well as dysthymic symptoms (23 patients). 3) *Unmixed non-hysteric group*: *Ss* diagnosed as symptomatic or character neurotics of the dysthymic type, without hysterical components (23 patients).

TABLE 1

Distribution of Subjects with Mean Age and Intelligence Quotient of Each Group

Group	*N*	Mean Age (years)	Mean I.Q. (W.B. Similarities and Block Designs Tests)
Hysteric	18	29.5	108.6
Mixed	23	28.2	107.1
Non-hysteric	23	28.2	112.2
Total:	64	28.5	109.0

Table 1 presents a distribution of the *Ss* with the mean age and intellectual level of the three groups.

METHOD

Each *S* was individually tested with a battery of nine tests especially devised for the present study. The characteristics of these tests and the instructions for their administration were thoroughly worked out in preliminary pilot studies.

The first series of four tests was intended to measure role-changing aptitude. After assuming a role, the examiner gave *S* the alternative of persisting in her choice or changing the role one or more times; the score being the number of changes. In three of these tests, 9 × 12 cm. photographs were used and in the fourth, 10 × 10 cm. photographs. The tests can be described as follows.

1. *Role change: Animals.* *S* was confronted successively with eight series of animals. Within each series there were six different animals which were repeated with slight changes in the following series (but with the same six species). Instructions were to select in each series the animal *S* would prefer to be in the hypothetical situation that she would have to be magically transformed into an animal. Score was the number of changes (0 to 7) from one to another animal species through the eight series.

2. *Role change: Ages.* Eight series of photographs of women's faces were presented. Each series had five faces: a little girl, an adolescent, a young adult woman, another in the fifties and an old woman.

The instructions were to select in each series the woman *S* would like to be if she would have to adopt one of the roles. Score was the number of changes (0 to 7) from one to another age in the successive choices.

3. *Role change: Leading position.* *S* examined consecutively five photographs representing different groups of persons; in each photograph there was a woman in an obviously dominant position over the rest of the group. Instructions were to select in each photograph the person *S* would like to be if she would have to take one of the parts in the scene. Score was the number of changes (0 to 4) in the successive choices of leading and non-leading positions.

4. *Role change: Professions.* *S* was confronted simultaneously with fourteen photographs, each one representing a woman in a different and clearly recognizable activity: student, housewife, secretary, hair-dresser, nurse, and so on. Instructions were to select one or more activities *S* would like to perform if she had to go back to work again. Score was the number of activities (1 to 14) selected.

Figure 1 presents an example of a series of the first two role change tests, and a sample of photographs used in tests 3 and 4.

The second series of five tests was designed to determine whether it was more difficult for the hysterics than for the dysthymics to retain some characteristics of human figures immediately after seeing them, or to recognize them after a certain period of time. These tests were administered in a dark room by projecting a series of slides on a screen for a short time and then asking *S* to describe certain aspects of the human figures or to recognize them after a definite period of time.

In the first two tests of delayed recognition there was an interval of thirty minutes between the first and the second part of the test administration.

5. *Immediate retention: Bodies.* Ten pictures of women (full-length images) were successively projected for a fourth of a second, with a screen size of 70 × 40 cm. A sample figure was shown while the instructions were given and the same figure was projected in order to demonstrate the exposure time. The task for *S* was to describe, immediately after seeing each figure, the following characteristics: position of the body, front view or side view, turned to the right or to the left; position of the face, with the same alternatives; position of each arm and position of each leg. Score was the number of correct answers (0 to 60).

6. *Immediate retention: Faces.* Ten women's faces were projected one at a time for a tenth of a second with a screen size of 50 × 75 cm. Instructions were given while *S* looked at a sample figure, which served also to demonstrate the exposure time. *S* was asked to report the following immediately after seeing the figure: if the woman had short or long hair; if she was serious or smiling; if her eyebrows were straight or curved, and if she had or did not have a visible earring. Score was the number of correct answers (0 to 40).

7. *Delayed Recognition: Bodies.* Twenty pictures of women (full-length images) were successively shown for a fiftieth of a second with a screen size of 40 × 70 cm. The instructions for the first group of photographs were to memorize the figures in order to recognize them later. After these figures had been projected, *S* was asked to wait for 30 minutes. Then another twenty figures were projected, one at a time, using the same exposure time as in the former series. Seven figures of the last series were taken from the first: thirteen were new ones. *S* was asked to identify those she had previously seen. Two scores were obtained here: the number of positive recognitions (0 to 7) and the number of false positive recognitions (0 to 13).

8. *Delayed Recognition: Faces.* This test was similar to the immediately previous one in the number of figures, exposure time, instructions, time interval before recognition trial, and scoring. The only difference was

FIG. 1. Samples of material used in role change tests. Test 1: Animals. Test 2; Ages. Test 3: Leading position. Test 4: Professions.

the content, women's faces in this case, and the screen size, 50 × 75 cm. The first part of this test was projected immediately after the first part of test 7; the second series of both tests, after the 30-minute interval, was administered in the same order.

9. *Delayed Recognition: Groups of faces.* Two photographic groups, one with eight and the other with five women's full-length figures, were successively projected for one second each, with a screen size of 65 × 75 cm. for the first series, and a screen size of 90 × 60 cm. for the second series. *S* was asked to memorize the women's faces in order to recognize them immediately afterwards. Twenty women's faces were then shown, each for a twenty-fifth of a second with a screen size of 90 × 60 cm.; the thirteen faces of the women in these two groups were randomly mixed with seven new faces *S* had not seen previously. Two scores were obtained: the number of positive recognitions (0–13) and the number of false positive recognitions (0–7).

Figure 2 presents a sample of the material used in the immediate retention and delayed recognition tests.

RESULTS

Comparisons of the various groups: These comparisons were done by analysis of variance. The numerical value of F, corresponding to the number of cases studied, is 3.15 for a probability of .05. Table 2, reporting role change data, indicates that there were no significant differences between the means of the various groups.

Immediate retention and delayed recognition of human images. In Table 3 it is seen that the differences between the means of the various groups, in the test of immediate retention of figures of bodies and faces, are not significant. In the case of the test of immediate retention of figures of bodies, *t*-values were calculated; these did not reach the required level of significance.

In Table 4 it is seen that the value of F reaches the .05 level in the delayed recognition test of faces (correct recognitions), and approaches this level in the test of delayed recognition of bodies. The values of *t* were calculated in these tests (Table 4). The following results were obtained in the delayed recognition test of bodies: $t = 1.37$ between the hysteric group and the mixed one; $t = 1.15$ between the mixed group and the non-hysteric one. Neither value is significant. Between the hysteric group and the non-hysteric one, the value of *t* reaches 2.65 ($p = .01$).

In the test of delayed recognition of faces, the values of *t* between the hysteric group and the mixed one, and between the non-hysteric group and the mixed one, were not significant ($t = 1.48$ and 1.64 respectively). Between the hysteric and the non-hysteric groups, the value of *t* reached 2.57 ($p = .05$).

Finally, in the test of groups of faces, no significant differences were found (Table 5).

Intercorrelations. In the total group of cases (N = 64), scores for the different tests were intercorrelated in order to observe the general relationship between the variables. Scores for each test were also correlated with age and intellectual level.

Correlations among the tests are presented in Tables 6 and 7. Table 6 gives the *r* values among the different tests; Table 7 shows the relationships of test results to age and intellectual level.

Within the group of tests dealing with role change, only one of the six *r* values reaches a significant level. On the other hand, the *r* values between the tests of immediate retention and of delayed recognition of bodies and faces, reach a significant value with but one exception.

Finally, the values of *r* between the tests of role change and tests of immediate retention and delayed recognition (which according to the hypothesis should have a negative value) do not—with one exception—reach significant levels.

In Table 7, it is seen that the tests of immediate retention of faces, and of delayed recognition of faces, show a negative corre-

FIG. 1. Samples of material used in role change tests. Test 1: Animals. Test 2: Ages. Test 3: Leading position. Test 4: Professions.

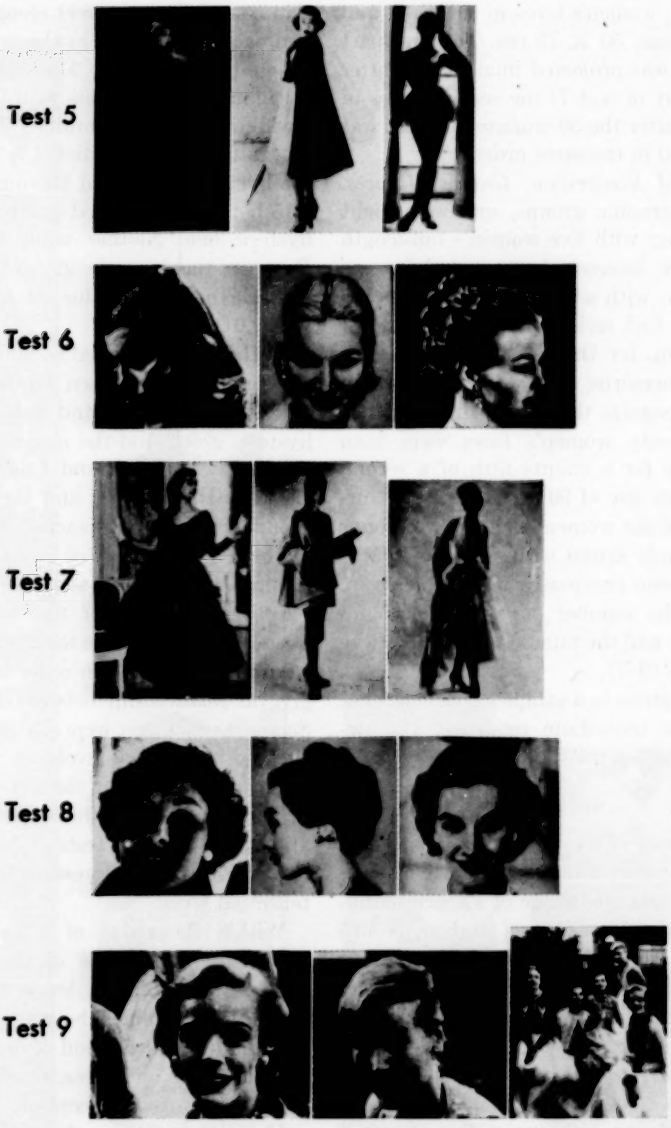

FIG. 2. Samples of material used in immediate retention and delayed recognition tests. Test 5: Immediate retention; bodies. Test 6: Immediate retention; faces. Test 7: Delayed recognition; bodies. Test 8: Delayed recognition; faces. Test 9: Delayed recognition; groups of faces.

lation at a significant level, with the age of the patients. On the other hand, the last test, that of groups of faces, shows a significantly positive correlation with intellectual ability.

DISCUSSION

Our hypothesis of a stronger tendency for role-changing in hysteric patients, as compared with non-hysteric patients, was not confirmed by this investigation. The tests

TABLE 2

Role Change: Animals

Group	Hysteric	Mixed	Non-Hysteric
Mean	3.00	2.56	2.43
Variance	5.33	5.83	6.79
F: .27; n.s.			
Role Change: Ages			
Mean	3.22	3.30	3.30
Variance	3.85	2.32	1.71
F: .01; n.s.			
Role Change: Leading Position			
Mean	1.62	1.87	1.65
Variance	0.98	1.33	1.36
F: .31; n.s.			
Role Change: Professions			
Mean	5.72	4.61	4.87
Variance	14.78	6.40	7.84
F .68; n.s.			

TABLE 3

Immediate Retention: Bodies

Group	Hysteric	Mixed	Non-Hysteric
Mean	35.61	41.00	39.96
Variance	105.31	51.13	42.28
F: 2.40; n.s.			
Immediate Retention: Faces			
Mean	21.56	23.87	23.30
Variance	30.72	23.35	26.76
F: .96; n.s.			

measuring role change have, among them, very low r values, with only one exception. It cannot, therefore, be taken for granted that they are measuring the same personality trait. There is, furthermore the problem of the validity of the role-changing tests.

Our second hypothesis, stipulating a lessened capacity of hysterics for retaining and recognizing human visual images, was also not confirmed, with the exception of the test of delayed recognition of bodies. With this single procedure, on comparing the means of the hysteric and non-hysteric groups, there is found a t-value of 2.65 ($p = .01$). The comparison of means between these groups and the mixed one, and the comparison of the computations of false

TABLE 4

Delayed Recognition: Bodies; Correct Recognitions

Group	Hysteric	Mixed	Non-Hysteric
Mean	3.50	4.30	4.83
Variance	3.69	3.29	1.67
F: 3.01; n.s.			
Delayed Recognition: Bodies; False Positive Recognitions			
Mean	4.05	4.35	5.60
Variance	12.40	3.76	8.43
F: .50; n.s.			
Delayed Recognition: Faces; Correct Recognitions			
Mean	3.72	4.61	5.26
Variance	6.10	1.78	1.85
F: 3.55; $p = .05$			
Delayed Recognitions: Faces; False Positive Recognitions			
Mean	4.33	5.04	6.56
Variance	7.69	9.38	10.53
F: 2.41; n.s.			

TABLE 5

Delayed Recognition: Groups of Faces; Correct Recognitions

Group	Hysteric	Mixed	Non-Hysteric
Mean	7.11	6.56	7.56
Variance	12.78	6.92	11.02
F: .52; n.s.			
Delayed Recognitions: Groups of Faces; False Positive Recognitions			
Mean	1.94	2.09	2.78
Variance	2.95	1.80	2.79
F: 1.66; n.s.			

TABLE 6

Values of r; All Tests (N = 64)

Test	1	2	3	4	5	6	7	8	9
1. Role change: animals		0.39	−0.08	0.03	−0.03	0.05	0.07	0.11	−0.01
2. Role change: ages			0.12	0.13	−0.09	0.06	0.06	0.02	−0.15
3. Role change: leading position				0.11	0.22	0.07	−0.06	−0.04	−0.15
4. Role change: professions					−0.17	−0.21	−0.38	−0.23	−0.20
5. Immediate retention: bodies						0.48	0.30	0.48	0.40
6. Immediate retention: faces							0.19	0.30	0.36
7. Delayed recognition: bodies								0.87	0.55
8 Delayed recognition: faces									0.63
9. Delayed recognition: groups of faces									
S.D.r_0 = .125									

TABLE 7

Values of r of All Tests with Age and Intellectual Level (N = 64)

Test	Age	Intellectual Level
1. Role change: animals	−0.13	0.01
2. Role change: ages	−0.04	0.16
3. Role change: leading position	0.08	0.10
4. Role change: professions	−0.02	0.17
5. Immediate retention: bodies	−0.08	0.24
6. Immediate retention: faces	−0.32	0.07
7. Delayed recognition: bodies	0.07	0.05
8. Delayed recognition: faces	−0.26	0.22
9. Delayed recognition: groups of faces	−0.14	0.25
S.D.r_0 = .125		

positive recognitions (F = .50), did not reach significant levels.

In the test of delayed recognition of faces, the values of *t*, on comparing the means of the hysteric and non-hysteric groups, reached significant levels in the scoring of correct recognitions (t = 2.57) as well as in the scoring of false positive recognitions (t = 2.32). The comparison of these groups with the mixed ones does not yield significant values in any of the two types of scores. The non-hysteric patients have, in this test, a general tendency to answer in an affirmative way, which may indicate a different attitude toward the test rather than a different recognition aptitude.

The positive correlations among almost all of the immediate retention tests and the delayed recognition tests would suggest that they measure a common psychological function.

Finally, the negative values of *r* among the immediate retention and delayed recognition tests of faces, and the age of the patients, constitute a finding that could be of importance for future research. This might also be said for the positive correlation between the test of groups of faces and intellectual level.

SUMMARY

The following working hypotheses were postulated. 1) Patients with clinical manifestations of hysterical personality should show greater aptitude than non-hysterical patients for changing roles voluntarily after having made an initial role choice. 2) This greater role-changing aptitude should be related to a lesser capacity for immediate retention and delayed recognition of visual images.

A battery of four role change tests and five immediate retention and delayed recognition tests was elaborated in order to investigate these hypotheses.

These tests were applied to 64 neurotic patients, divided in three groups: hysteric, non-hysteric and mixed.

The results did not confirm the stated hypotheses, although one of the delayed recognition tests, using full-length human images, discriminated at a significant level between the hysteric and non-hysteric groups.

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PSYCHOLOGICAL CHARACTERISTICS OF PSYCHIATRIC ADMISSIONS AND IMPLICATIONS FOR TREATMENT

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To do anything well it is necessary to know clearly what needs to be done. To carry out the treatment function of a psychiatric hospital meaningful information about incoming patients is essential. This study will describe the psychological characteristics of 225 patients admitted to a large public hospital. A set of rating scales provides a multidimensional but quantifiable means to describe this group of patients. In addition, the descriptive data will be analyzed, and the results used to demonstrate one way of using such findings to formulate a treatment program.

This multidimensional approach should provide more sensitive and flexible descriptions of patients than the traditional diagnostic labels. The usual psychiatric diagnosis is brief, can be handled statistically and through long and extensive usage communicates a highly elaborate stereotype of a particular disorder (1). However, such categorizing has known limitations because it demands that people, with all their uniqueness, be squeezed into a few pathological types. Also, differences in usage and interpretation produce different classifications of patients depending on the clinician, hospital, period in the patient's disturbance and other factors. When a single classification serves as the chief descriptive device, and often represents a forced, arbitrary or only partially true classification which could easily have been something else, the whole system which relies on such information is in jeopardy.

The multidimensional approach, being amenable to quantification, also has an advantage over written reports that usually accompany a diagnosis. Such prose statements can often capture the true individuality of each patient but because of their literary nature, they do not allow objective comparison for accuracy and consistency. Nor can they be easily handled quantitatively to study general trends or serve as a basis for grouping similar patients. The multidimensional ratings used in this study serve as an example of a descriptive system that falls between the limited but popular single diagnosis, and the more life-like but complicated written statement.

In addition to describing general characteristics of psychiatric admissions, this report is intended to show how such data may be analyzed to provide useful guides in planning treatment programs. Often treatment procedures and important decisions in the handling of patients are determined by building size and design, past traditions or practices, particular staff interests or biases, training needs, research projects, or pressures to fill beds or increase turnover. Information about and implications of the actual supply of patient material are sometimes ignored. Possibly this occurs because information about patients is not often available in useful and meaningful form. For instance, to describe a person as a passive-aggressive personality, certainly implies something is wrong, but does not define just what needs to be changed. A more detailed description might indicate that the passive-aggressiveness was a stable part of the person, but that his current anxiety is related to new responsibilities connected with a promotion, and this anxiety needs to be handled so a new balance can be established.

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PROCEDURES

Since 1957 almost all psychiatric admissions (85 to 90 per cent) to this hospital were given some group psychological tests. The battery used has varied, but generally contains one or more intelligence tests, a biographical information sheet, a sentence completion test and a personality questionnaire. For about a half-year the results of the tests, with impressions from a brief interview and some background information, were interpreted and reported by means of 18 rating scales rather than by the more usual narrative summary and diagnosis.

Choice of psychological characteristics. On the basis of considerable experience with psychological test reports and a systematic review of the types of things usually said on test reports, a number of traits or characteristics that do not apply to all cases but tend to vary from case to case were identified. In addition, other variables were considered because they were easily measured from tests or suggested by factor analytic studies. From this pool of possible dimensions or traits, 21 were chosen as the most significant and useful in facilitating psychological understanding of new patients.

Six variables were classified under *Psychological Functioning* and included Goal Orientation and Self Direction, Present Intelligence, Control of Behavior, Socialization, Perceptual Disorder, and Thought and Language Disorder. Six other variables were classified as *Social and Environment Factors* and included Work Stability Record, Patient's Family and Friendship Ties, Socio-Economic Class, Job Skill and Training, Education, and Marital Status (not handled as a variable because of its categorical rather than continuous nature). Four measures of the patient's *Emotional Status* included Manifest Anxiety, Feelings Toward Others, Self-Evaluation, and Mood Level. A final section on *Prognosis and Recommendations* included Basic Treatment Strategy, Participation in Own Treatment, Age, and separately Predicted and Recommended Length of Hospital Stay.

Patient evaluation and ratings. This study reports the evaluation of 225 newly admitted patients. Fifty-nine per cent of the evaluations were done by the author while the others were done by seven other psychologists working under the author's guidance. Necessarily, the evaluations and ratings are a product of the specific information available (group test results, brief interview, and limited background data) and of the particular abilities of the raters.

Ratings of each characteristic are reported for the total group of 225 patients in Table 1. For each trait, such as *Present Intelligence*, the number of patients rated as belonging to each level of intelligence was determined and these numbers changed to percentages. Thus, for Present Intelligence, one per cent scored at the very superior level; four per cent superior level, sixteen per cent bright normal and so on.

The ratings for Present Intelligence were made by averaging IQ scores achieved on the Wonderlic Personnel Test Form A and the Cattell Culture Free Test Form 2A. Because the Wonderlic does not provide IQ norms and the Cattell norms were completely out of line with WAIS IQ scores and reasonable expectations for our patients, new IQ norms were established for both tests on our patients prior to this study. These new norms follow closely the level and score range for the Wechsler tests. Predicted Length of Hospital Stay was derived by an empirically developed scale on the MMPI, based on three previous studies, to predict length of stay at this hospital. The patients' scale score for length of stay was automatically transferred to predetermined levels on the rating scales. Education, Marital Status and Age were directly taken from the Patient's Biographical Information Sheet. The other ratings represent clinical impressions based on combined test data, biographical information and interview behavior. An esti-

TABLE 1

Rated Personality Characteristics of 225 Psychiatric Admissions

Characteristics and Rating Steps	Percentage
1. Goal orientation and self direction	
Integrated, realistic life goals	0
Strong standards, long term plans	5
More purpose, self direction	18
Average	16
Less purpose, ambition	32
Guided by others, circumstances	20
No goals, standards. Lives for moment	7
2. Present intelligence	
Very superior	1
Superior	4
Bright normal	16
Average	59
Dull normal	13
Borderline	6
Defective	0.5
3. Control of behavior	
Immobilized, bound by rituals	0
Rigid, follows routines	4
Careful, thoughtful	19
Average control, spontaneity	20
Spontaneous, lively	7
Impulsive, lapses in control	44
Unpredictable, over-reacts	3
Other	3.5
4. Socialization	
Extrovert, very sociable	2
Sociable, talkative	17
Average social contact	36
Shy, prefers being alone	40
Withdrawn, avoids people	4
5. Perceptual disorder	
No serious distortions in perception	45
Biased perceptions, omissions, mistakes	28
Distorted view of self, others, hypersensitive	22
Hallucinations, psychotic distortions of reality	5
6. Thought and language disorder	
No noticeable thought or language disturbance	63
Poor concentration, unclear communication	28
Disrupted, confused, indecisive	7
Incoherent, irrelevant, disorganized	2
7. Work stability record	
Changes only for advancement	0.5
Relatively stable	24
Many job changes	16
Brief periods of unemployment	13
Unemployed for long time	42
Other	4
8. Patient's family and friendship ties	
Very understanding	1
Good friends, loyal family	11
Responsible family	15
Ambivalent	32
Indifferent	12
Hostile	10
None	9
Not determined	7
Others	2
9. Socio-economic class	
Upper	0
Lower Upper	0
Upper Middle	6
Middle	12
Lower Middle	33
Upper Lower	21
Lower	27

TABLE 1—*Continued*

Characteristics and Rating Steps	Percentage
10. Job skill and training	
Professional training	2
Highly trained, skill	5
Moderate training, skills	32
Minor, simple skills	36
No special skills	25
11. Education	
Grade 0–6	5
Grade 7–8	12
Grade 9–11	23.5
H.S. Graduate	32.5
Some College	16
College Graduate	10
12. Marital status	
Single	29
Married	37
Divorced	24
Separated	9
Widowed	1
13. Manifest anxiety	
Bizarrely cheerful	0
Oblivious to problems	2
Unconcerned, cheerful	10
Average concern	14
Worrisome, uneasy	37
Very tense, anxious	32
Disrupting, disabling	4
14. Feelings toward others	
Excessive friendliness	1
Deep warmth, appreciation, closeness	0.5
Friendly, supportive, trustful	15
Average warmth and trust	18
Uneasy, cold	35
Cynical, bitter, manipulates	19
Suspicious, hates, fears	9
Other	3
15. Self-evaluation	
Delusions of self-worth	0.5
Conceited, boastful	2
Favorable view of self, confident	14
Average self-esteem	22
Feels inadequate	34
Depreciates self	26
Condemned, worthless	2
16. Mood level	
Elated, excited	0.5
Buoyant, full of life	0.5
Cheerful, lively	10
In between	29
Glum, tired	24
Apathetic, discouraged	34
Retarded, immobilized	1
17. Basic treatment strategy	
Restore basically sound personality to prior effective level	24
Correct blockage, severe conflicts in otherwise sound personality	28
Modify workable but socially unsuited personality	16
Develop personality in patient who has never functioned well	21
Find suitable placement for permanently disabled patient	11
18. Participation in own treatment	
Genuine attempts to change, use therapy	6
Ambivalent, attempts to help self	24
Passively accepts treatment, up to doctor	38
Manipulates, demands, intellectualizes	24
Delusions of being harmed, resists, uncooperative	6
Other	2

TABLE 1—*Concluded*

Characteristics and Rating Steps	Percentage
19 Age	
20	19
30	42
40	24
50	8.5
60	6
70	1
20 Length of hospital stay (Predicted)	
Very brief, 1 month	6
Brief, 1 to 2 months	10
Short, 2 to 3½ months	13
Average, 4 to 6 months	25
Extended, 7 to 12 months	29
Long, 13 to 18 months	11
Very long, over 18 months	4
21 Length of hospital stay (Recommended)	
Very brief, 1 month	10
Brief, 1 to 2 months	25
Short, 2 to 3½ months	20
Average, 4 to 6 months	21
Extended, 7 to 12 months	15
Long, 13 to 18 months	5
Very long, over 18 months	1
Other	2

TABLE 2

Inter-rater Reliability

Personality Characteristic	r (N = 40)
Goal orientation, etc.	0.78
Control of behavior	0.54
Socialization	0.76
Perceptual disorder	0.47
Thought and language disorder	0.43
Job skill and training	0.59
Work stability record	0.82
Patient's family and friendship ties	0.67
Socio-economic class	0.80
Manifest anxiety	0.65
Feelings towards others	0.49
Self evaluation	0.76
Mood level	0.55
Basic treatment strategy	0.38
Participation in own treatment	0.52
Recommended length of hospital stay	0.47

mate of the reliability of these ratings was obtained by having the author independently rate 10 cases done by each of four other raters and then correlating the 40 pairs of ratings. Table 2 presents these results. Some of the ratings, such as Goal Orientation, Work Stability Record, and Socio-Economic Class were rated primarily on information provided by the patient on a biographical information sheet and could be rated quite directly without much use of inference. Similarly, Self Evaluation and Manifest Anxiety could usually be rated simply on the basis of results from such tests as the MMPI. Such ratings proved fairly reliable. Other ratings require skill in finding pathology (*e.g.* Perceptual Disorder and Thought and Language Disorder) or involve the raters' personal preference or bias (*e.g.* Basic Treatment Strategy and Recommended Length of Hospital Stay); these yielded lower reliability coefficients.

Considering only the modal ratings, this population can be described as less purposeful and self-directed, average in intelligence, impulsive or showing lapses in control, shy or average in sociability, and without serious distortion in perception or noticeable thought or language disturbance. They are also people who have been out of work for a long time, whose family or friends are ambivalent towards them, and who are members of the lower middle class. They have only minor, simple job skills, are high school graduates, and are married. Emotionally they may be very tense and anxious or at least worrisome and uneasy, feel uneasy and/or cold toward others, feel personally inadequate and appear to be in an apathetic and discouraged mood. As for the hospital, what seems indicated and likely is correction of severe blockage or conflicts in an otherwise fairly effective personality with a patient who will passively accept treatment, who is in his late thirties and who will probably stay about seven months but who should stay only about two months. There is, of course, some variability about these modal ratings, and, as is true of most descriptions of an "average" person, few patients fit these modal ratings on all characteristics.

Interrelation of the patient characteristics. In order to understand the interrelation of the variables used to describe this patient sample, each variable was correlated with each other and the resulting matrix of inter-

correlations (Table 3) factor analyzed. One hundred of the 190 intercorrelations are significantly greater than zero and positive, while three are negative. The remaining 87 are so small as to suggest no systematic relationship between the variables. These findings indicate some overall relatedness of the ratings. The original scales were constructed so that the high end indicates a normal or desirable rating for most scales and the low end, pathological conditions. However, despite this general relatedness, the average correlation is only .18, and there are only seven correlations (out of 190) larger than .50, the level at which one variable can account for 25 per cent of the variation in another variable. Thus, despite some overlap, the scales also are relatively independent of one another.

Factoring of the correlation matrix by the centroid method yielded four factors which were then rotated to maximize positive loadings and put factor dimensions through meaningful clusters of scales (Table 4). The four factors together accounted for only 43 per cent of the total variance. This result could be due to low reliability of the rating scales, extraction of an insufficient number of factors, and/or actual independence of the ratings. Since the ratings were selected to be relatively independent and to tap different areas of personality, the latter explanation is probably the major reason why four factors could account for less than half the variation in the twenty variables under consideration.

Examination of the rotated factor loadings provides some clues as to the nature of the dimensions established by this factor analysis. The first two factors are each clearly identified by two clusters of scales describing variables that logically seem related. Factor 1 describes general life-long achievement, goal directedness, intelligence and socio-economic status. It accounts for 32 per cent of the common factor variance and 14 per cent of the total variance. Rating scales with high loadings on it are Socio-Economic Class, Job Skill and Training Intelligence, Basic Treatment Strategy (in part suitability for psychotherapy), Goal Orientation and Self-Direction, Education and Work Stability Record. At the high end this factor describes the person who has achieved social status through completion of advanced education, has high intelligence, maintains long term life goals, and sees talking about problems as a good way to solve them.

Factor 2 clearly measures a dimension of self-esteem, confidence and comfort in making social contacts. It accounts for 30 per cent of the common factor variance and 13 per cent of the total variance. Rating scales with high loadings on this factor are Self-Evaluation, Mood Level, Manifest Anxiety, Socialization, and a moderate-size negative loading on Participation in Own Treatment. A high factor score would indicate someone who had a favorable idea of his own worth, feels cheerful or elated, is free of anxiety, is sociable and talkative, but who either resists treatment or tries to manipulate or demand treatment to suit his needs rather than sincerely seek change. In a hospital population a really high score on this factor suggests several interpretations: the patient totally lacks insight, is in a manic phase, or should not even be in the hospital. A low factor score indicates a poor evaluation of one's self plus social withdrawal and fits more closely the usual stereotype of the patient role.

Factor 3 shares several ratings with Factor 4 but is defined uniquely by one rating scale. Factor 3 seems to measure the degree to which the patient has accumulated family and friendship ties as well as displaying a friendly attitude in his present behavior, with the effect of earning a good prognostic recommendation. Factors 3 and 4 each account for 19 per cent of the common factor variance and eight per cent of the total variance. Factor 3 has the highest loadings on Feelings Toward Others, Recommended Length of Hospital Stay, Perceptual Dis-

TABLE 3

Intercorrelations Between Report Variables

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Intelligence		0.12	0.09	0.17	0.14	0.47	0.20	0.10	0.32	−0.08	0.26	−0.02	−0.09	−0.04	0.08	0.34	0.27	0.06	0.14	−0.01
2. Goal			0.20	0.35	0.17	0.13	0.39	0.37	0.06	0.26	0.45	0.15	0.26	0.30	0.28	0.33	0.01	0.33	0.44	0.17
3. Control Behavior				−0.06	0.14	0.11	0.10	0.13	0.07	0.13	0.19	0.02	0.21	0.00	−0.06	0.15	0.05	0.06	0.13	0.31
4. Socialization					0.29	0.26	0.24	0.17	0.03	0.04	0.23	0.39	0.36	0.45	0.52	0.25	−0.08	0.18	0.38	0.11
5. Perceptual Disorder						0.37	0.23	0.22	−0.04	0.18	0.22	0.19	0.46	0.16	0.17	0.31	0.16	0.30	0.55	0.22
6. Thought & Language							0.16	0.18	0.03	0.03	0.18	0.06	0.13	0.06	0.10	0.39	0.13	0.24	0.39	0.17
7. Job Training								0.03	0.32	0.09	0.77	0.20	0.18	0.02	0.06	0.29	0.15	0.28	0.30	0.20
8. Work Stability									0.06	0.19	0.34	0.09	0.18	0.07	0.15	0.47	0.16	0.17	0.37	0.02
9. Education										−0.05	0.38	0.04	−0.10	−0.04	0.03	0.21	0.01	−0.08	−0.03	−0.16
10. Patient's Family & Ties											0.24	−0.02	0.23	0.10	0.06	0.21	0.23	0.17	0.27	0.11
11. Socio-Economic												−0.06	0.19	0.06	0.14	0.42	0.23	0.24	0.34	0.19
12. Manifest Anxiety													0.33	0.62	0.64	0.07	−0.17	0.03	0.25	0.09
13. Feelings														0.19	0.22	0.17	0.22	0.16	0.35	0.27
14. Self Evaluation															0.63	0.01	−0.30	0.12	0.23	−0.21
15. Mood Level																0.14	−0.12	0.16	0.35	0.05
16. Basic Treatment																	0.25	0.13	0.41	0.01
17. Part in Own Treatment																		0.01	0.15	0.01
18. Predicted Length of Hospital Stay																			0.56	0.34
19. Recommended Length of Hospital Stay																				0.42
20. Age																				

TABLE 4

Centroid and Rotated Factor Loadings

Rating Scales	Centroid factors				Rotated factors				h^2
	1	2	3	4	1	2	3	4	
1. Intelligence	0.34	0.28	−0.41	0.22	0.61	−0.02	−0.17	0.12	0.42
2. Goal	0.59	−0.06	−0.01	0.21	0.46	0.30	0.31	0.13	0.40
3. Control Behavior	0.26	0.16	0.16	0.11	0.21	0.07	0.28	0.09	0.13
4. Socialization	0.55	−0.42	−0.14	−0.10	0.17	0.64	0.10	0.25	0.50
5. Percept. Disorder	0.57	0.06	0.27	−0.19	0.14	0.14	0.44	0.44	0.43
6. Thought & Language	0.45	0.23	−0.11	−0.43	0.16	0.03	0.02	0.66	0.45
7. Job Training	0.57	0.19	−0.33	0.18	0.65	0.14	0.00	0.23	0.50
8. Work Stability	0.45	0.09	0.06	0.20	0.39	0.10	0.29	0.10	0.25
9. Education	0.16	0.16	−0.47	0.18	0.46	0.03	−0.30	0.02	0.30
10. Patient's Family & Ties	0.30	0.07	0.27	0.24	0.24	0.00	0.41	−0.03	0.23
11. Socio-economic	0.61	0.36	−0.32	0.36	0.83	0.01	0.06	0.17	0.73
12. Manifest Anxiety	0.40	−0.63	−0.06	−0.09	−0.01	0.75	0.12	0.09	0.57
13. Feelings	0.49	−0.16	0.31	0.14	0.16	0.26	0.56	0.07	0.42
14. Self Evaluation	0.35	−0.71	−0.18	−0.07	−0.02	0.82	0.00	0.03	0.67
15. Mood Level	0.45	−0.59	−0.16	−0.16	0.02	0.75	0.05	0.19	0.60
16. Basic Treatment	0.57	0.26	−0.16	0.13	0.57	0.05	0.13	0.29	0.43
17. Part in Own Treatment	0.19	0.40	0.11	0.15	0.30	−0.30	0.21	0.10	0.23
18. Predicted Length of Hospital Stay	0.46	0.09	0.21	−0.24	0.07	0.08	0.33	0.44	0.32
19. Recommended Length of Hospital Stay	0.75	0.09	0.26	−0.31	0.19	0.20	0.49	0.64	0.73
20. Age	0.31	0.15	0.35	−0.17	0.00	−0.07	0.41	0.31	0.27
Common factor variance	51%	24%	14%	11%	32%	30%	19%	19%	100%
Overall variance					14%	13%	8%	8%	43%

order, Patient's Family and Friendship Ties, and Age. A low factor score would describe someone who appeared hostile, experienced hallucinations or distortions in perception, came to the hospital with few or hostile relations with others, is younger in age (in his twenties), and elicited a recommendation for a longer hospital stay.

Factor 4 contains both the prognostic recommendation and prognostic actuarial prediction but is concerned primarily with psychotic thinking. This factor has the highest loadings on Thought and Language Disorder, Recommended Length of Hospital Stay, Predicted Length of Hospital Stay, and Perceptual Disorder. A low factor score describes someone who is confused or disorganized, hallucinating, probably clearly psychotic by several standards, actuarially predicted to stay a long time in the hospital, with a recommendation that concurs with this prediction.

Factor scores for each patient were obtained by the following procedure. For each factor four rating scales with the highest and most independent loadings were selected. Because the range of the ratings was not at all uniform (*i.e.* Age ranged from 20 to 73 while Perceptual Disorder ranged only from 0 to 3) the raw scores were normalized. In addition the scores were weighted so their contribution to a factor score would be proportional to their loading on that factor. Next, three judges determined the point on each of the rating scales where a rating could be clearly considered abnormal. The numerical values of the four points for each factor were summed and became the cutting score for that factor. Factor scores above this value were obtained by patients who received at least an average of normal ratings for a particular factor while factor scores below the cutting score indicated deviant, undesirable or pathological ratings. Table 5 shows the percentage of patients scoring above or below these cutting scores for each

TABLE 5

Percentages of Patients Scoring High and Low on Single Factor Scores and Combinations of Factor Scores

Factor (s)	High or Low	Percentage	Factor (s)	High or Low	Percentage
1	High	20	1, 2, 3, 4	L, L, L, L	21
	Low	80		L, L, L, H	16
2	High	23		L, L, H, L	5
	Low	77		L, H, L, L	5
3	High	48		H, L, L, L	5
	Low	52		L, L, H, H	22
4	High	63		L, H, H, L	0
	Low	37		H, H, L, L	1
1, 2, 3 and 4 combined	Low, Low, Low	33		H, L, H, L	0
	Low, Low, High	30		L, H, L, H	2
	Low, High, Low	5.5		H, L, L, H	1
	High, Low, Low	6		H, H, H, L	0
	Low, High, High	11		H, H, L, H	1
	High, High, Low	1		H, L, H, H	7
	High, Low, High	8		L, H, H, H	10
	High, High, High	5.5		H, H, H, H	4

factor and combinations of cutting scores for several factors.

DISCUSSION

Considering the factor scores one factor at a time, several important findings emerge. On Factor 1 only 20 per cent of the sample of 225 patients score high enough to be considered moderately vocationally trained, of average intelligence; middle class people rated amenable to personality changing types of psychotherapy. Since so much of psychiatric treatment is geared to the ideal of intensive psychotherapy, the fact that 80 per cent of new admissions appear less than well suited for such treatment should stimulate the development of more appropriate forms of treatment for these people. At the same time it should enable treatment personnel who are unable to offer psychotherapy to all patients to accept the possibility that many patients may not want—or be able to benefit from—"talking" types of treatment. Another implication of this finding, which Hollingshead and Redlich (4) have already noted, is the danger of middle class staff members imposing their norms, behavior and forms of recreation upon lower class people, or using middle class norms as criteria to judge the normality or appropriateness of the behavior of lower class patients.

The preponderance of low scores on Factor 2 is quite understandable for a sample of newly admitted patients. One might expect most of them to feel anxious, socially withdrawn, depressed, and not very happy with themselves. The exact proportion of patients who recognize difficulties or discontent with themselves may not be generally known and is sometimes over or under-estimated by staff members. This study indicates there are about three patients who recognize that all is not well with them, for every one who seems to feel fine. Generally, staff are equipped and work well with a patient who declares he is discontented with himself or confesses that he is mentally ill. However, when a patient appears cheerful, self-confident, and denies there is anything wrong with him, he may pose a more difficult treatment problem. Should his good self-picture be left intact, or should he be dealt with so that this picture is shattered or altered and he recognizes his deficiencies?

Factor 3 shows an almost even split between those with a friendly approach and interpersonal ties, and those who seem hostile and have less in the way of interpersonal

assets. As many as 48 per cent of the patients are found in the high group indicating that they present a friendly manner and come to the hospital with interested family or friends in the community.

Factor 4 suggests that one third (37 per cent) of newly admitted patients shows definite signs of a current psychotic condition: these persons are poor prognostic prospects. Yet all new admissions in this hospital start their hospital career on a closed ward with most privileges and ordinary rights denied to them. These data suggest the possibility of gearing admission procedures to the majority of patients, with exceptions being made for the relatively few severe cases.

Because of the considerable overlap of scales on Factors 3 and 4, these two factors were combined: the frequency of combinations of high and low factor scores for Factors 1, 2 and the combination of 3 and 4 are given in Table 5. High scores on both Factors 3 and 4 are characteristic of friendly, nonpsychotic, older patients with good prognosis, while low scores would reflect psychotic, hostile, isolated, younger patients with poor prognosis.

The most frequent combination covered 33 per cent of the cases and included persons who had achieved little socio-economically, felt inadequate, anxious, or depressed, and had psychotic symptoms and/or appeared hostile with a poor prognosis. These are sick people who know it and have demonstrated their deficiencies in meager life achievement. The next most frequent group contained 30 per cent and might be characterized also as failures in vocational and intellectual achievement—persons who feel inadequate, depressed or anxious, but without psychotic symptoms and with a more friendly manner and better prognosis. This category would seem to include disturbed neurotics and character disorders who have not made much of their lives but who can maintain fairly adequate personality integration.

The other classifications contain many fewer patients. The last category, with 5.3 per cent of all cases, includes persons who have achieved well, feel fine, have no psychotic symptoms, are friendly and need only a very brief hospital stay. In terms of factor scores alone, these patients represent well adjusted people who should not be in a hospital at all.

Since the factor scores accounted for only 43 per cent of the total variance of the 18 rating scales (and since 18 rating scales cannot report all the complex qualities of mental health or illness), a person may very well need hospitalization while achieving normal scores on these particular factors. On the other hand, it is also quite possible that some patients, after being admitted to the hospital and when given psychological testing several days later, present a real picture of good adjustment at that time. A large number of the hospital's newly admitted patients are transferred in from state hospitals, and at the time of their arrival they may be in good remission from their original disorder, nearly ready to be discharged back to the community. Unfortunately, when they enter the hospital as relatively unknown persons, it takes some additional time to recognize their good adjustment and initiate discharge procedures.

The most frequent combination of all four factors describes a lower class person who subjectively does not feel well but who appears friendly, with good interpersonal relations, without psychotic symptoms, and with a good prognosis. The next most frequent combination is composed of lower class, subjectively disturbed, hostile, isolated, psychotic, poor prognosis individuals. The third most numerous category is similar to the one just described, except for the presence of psychotic symptoms and the very poor prognosis.

Implications for treatment. One possible way of utilizing the information supplied by this study would be to classify into a few broad, meaningful groups, patients who seem to present clearly different problems of

opportunity for change, and then try to match them with available general types of treatment or try to develop new forms of treatment to handle particular kinds of patients. Within the broad categories it will always be possible to vary treatment programs according to needs of individual patients.

This approach is consistent with the theories and research findings of Festinger (2). He outlines a theory of social comparisons wherein people are more likely to compare themselves with others similar to themselves in ability and opinions. People will also tend to be attracted to and develop friendships with those like themselves, according to Newcomb (5). When small differences become apparent, communication is likely to be increased and pressure towards change and conformity occur, but when large differences are apparent, the other person or group is dismissed as not an appropriate figure for comparison, with such comments as, "He's crazy," or "They can't understand me." Relatively homogeneous groups, especially in regard to socioeconomic achievement and level of adjustment, should therefore enhance meaningful social comparison and group communication if properly understood and utilized.

If living on a particular ward is intended to be a therapeutic change-inducing experience, then such considerations as these are very important. If the ward is conceived only as a convenient administrative waiting room where patients live in a kind of suspended animation between psychotherapy contacts, then, of course, these considerations would be accorded less importance.

The eight combinations suggest four different classifications. Patients alike in vocational and educational achievement and presence or absence of psychotic symptoms would be kept in homogeneous groups, but those with favorable and unfavorable self feelings would be lumped together. Thus, one category could be composed of those who had achieved little vocationally and showed psychotic symptoms. This group—as estimated from the present sample—would include about 38.5 per cent of all cases, with 5.5 per cent feeling well disposed towards themselves, and the other 33 per cent anxious, depressed or feeling quite inadequate. The similarity in socioeconomic level might permit better communication in the group, and they could also understand each other's psychotic thinking better as well as be less disturbing to non-psychotic patients. By including some patients with favorable self impressions, these latter conceivably could spark the group from being entirely defeatist and downcast in attitude, while themselves perhaps gaining some insight into their own troubles.

The next group would be composed of 41 per cent of the patients; including those who had not achieved much socioeconomically but who did not show psychotic signs. This group would include many patients traditionally diagnosed as character disorders and neurotics. About three-fourths would be feeling inadequate, depressed or anxious, while one quarter would feel fairly well satisfied. Again, similarity in socioeconomic status and non-psychotic problems should make communication more meaningful, while the difference in self attitudes might stimulate interchange of feelings.

Another group would constitute only seven per cent of the total sample (and could either be handled separately or incorporated with the first group, above). This group is characterized by educational and vocational achievement, with psychotic symptomatology and a mixture of favorable and negative self attitudes. One justification for separating these people would be that they often receive preferred treatment in any event, *e.g.* individual psychotherapy; it probably would be best carried out for all in the group, rather than for some, and while living with a heterogeneous collection of other patients.

The final group would consist of 13.5 per cent of the total, to include those who had achieved socioeconomically and presenting

no psychotic symptoms. This group comprises what is often felt as the "cream of the crop" and is in high demand as individual and group therapy candidates. The writer seriously questions the wisdom and ethics of concentrating professional talent on these patients; instead, their potential for spontaneous remission or improvement with minimum care and attention should be more fully exploited and studied. Nevertheless, collecting them in one group should be advantageous, either in terms of concentrating treatment, or making possible more objective study of alternative strategies. It is possible that many of them could be discharged from the hospital and treated on an out-patient basis.

SUMMARY

Two hundred and twenty-five consecutive psychiatric admissions were given group psychological tests. On the basis of results from these tests, plus impressions from a brief interview and some background data, each patient was rated on 18 behavior characteristics and three biographical variables. Results for the total sample are reported. The ratings and variables were factor analyzed, and four factors found that accounted for 43 per cent of the overall variance. One factor seems to reflect primarily educational and vocational achievement. The patient's subjective feelings of anxiety, depression or inadequacy are measured by the second factor. The third factor measures the subject's ties and friendliness to others, as well as prognosis. The fourth factor taps psychotic symptoms along with prognosis.

These findings were used to suggest grouping of patients with similar characteristics into four treatment programs, geared to each group's particular problems and capitalizing on certain similarities in each group.

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THE EFFECTS OF ISOXSUPRINE HYDROCHLORIDE (VASODILAN) ON CHRONIC CEREBRAL ARTERIOSCLEROSIS

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The problem of cerebral arteriosclerosis is one of major proportions in that patients over 65 comprise 30 per cent of the resident population of mental hospitals in this country and 41 per cent of these suffer from senile and arteriosclerotic brain syndromes (8). At present, there is little in the way of specific treatment for these individuals and their care has been largely custodial. This paper is a report of a study involving the use of a vasodilating agent in the treatment of patients suffering from chronic cerebral arteriosclerosis.

Isoxsuprine hydrochloride (Vasodilan) is a direct-acting relaxant of smooth muscle with selectivity for vascular (peripheral and cerebral) and uterine musculature (3, 6). Dilatation of cerebral vessels by isoxsuprine hydrochloride in monkeys, using serial X-ray photography following intracarotid injection of Vasodilan, has been described by Blouin and Overman in an unpublished report (2). Similar effects were noted in humans by Gloning and Klausberger (4), who filmed the contrast medium through the carotid and cerebral vessels and demonstrated the acceleration of the time of disappearance of the radio-opaque material in the end vessels, particularly in arteriosclerotic subjects.

In a study of 37 patients suffering from cerebral vascular disease, Birckmayer and Mentasti (1) observed improvement in 24 patients' alertness, activity, interest in their surroundings, and performance on psychological tests. In view of this report, controlled evaluation of the effectiveness of isoxsuprine hydrochloride on the intellectual functioning and adjustment of chronic cerebral arteriosclerotics seemed indicated.

METHOD

Initial screening procedures included complete neurological and physical examinations of patients with a diagnosis of chronic brain syndrome secondary to cerebral arteriosclerosis at the Norfolk State Hospital, Norfolk, Nebraska. No patients were included where there was a record of a functional psychosis prior to evidences of organic deterioration. A few patients with diagnoses of senile brain disease were included where evidence of cerebral arteriosclerosis was also present. Initial laboratory tests included white blood count and differential, hemoglobin, complete urinalysis, and serum cholesterol studies. All evaluations were reviewed by two physicians who selected the patients for the study. The main reasons for excluding subjects were severe cardiovascular findings. Altogether, 27 male patients were selected for the study, none of whom were receiving vasodilators.

The first twenty patients selected by the above procedure were tested psychologically, using the Similarities, Digit Span and Block Design subtests of the Wechsler Adult Intelligence Scale, and the Porteus Maze Test. Because of limitations of time available for testing, the last seven patients selected were not tested psychologically. The twenty patients who were tested were matched individually in two groups on the basis of age and intellectual performance.

All 27 patients were initially evaluated on the "Care of Self and Social Responsibility"

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scale of the Ferguson-McReynolds-Ballachey Hospital Adjustment Scale (HAS) (7). The seven patients who had not been tested psychologically were assigned to one of the two groups so that the mean ratings on the HAS were comparable for both groups.

After the assignment of the patients to two groups, an independent individual designated the drug and placebo groups. The mean age of the total drug group was 73.3 ± 8.9 and the mean age of the total placebo group was 71.4 ± 10.6. The drug group was placed on a constant dosage of 20 mg. of isoxsuprine hydrochloride q.i.d. Double-blind procedures were followed throughout the study. Evaluation procedures consisted of readministering the psychological tests and the HAS at eight weeks and 14 weeks while the patients were still on medication. All laboratory tests were repeated at eight and 14 weeks except the serum cholesterol studies which were repeated only at eight weeks.

RESULTS

None of the laboratory tests showed significant changes when the two groups were compared, all remaining within normal limits. No significant side effects were noted.

Table 1 presents the results obtained on the psychological tests for the drug and placebo groups. Raw scores are reported in the analysis of the WAIS subtests. Changes between the three trials were analyzed for the drug and placebo groups *separately*. Eight matched pairs of patients completed the study for a total of 16 patients for these analyses. A distribution of difference scores was obtained by pooling two kinds of comparisons; the pretest performance score was compared to the mean of the two retest scores, and the eight-week performance score was compared to the 14-week performance score. The pooled distribution of these two difference scores was analyzed, using the Wilcoxon matched-pairs signed-ranks test (9), using a two-tailed test. The results indicated that the drug group improved significantly in Similarities ($p = .05$), whereas the placebo group did not ($p = .60$). The only other test where the drug group's improvement approached significance was on the Block Design test ($p = .14$). The placebo group showed a decline on this test which approached significance ($p = .08$).

The differences between the drug and placebo groups in *rate of change* was analyzed by testing the difference between the two

TABLE 1

*Psychological Test Results of Matched Pairs**

Test	Groups (N = 16)	Pre-Test	8 Weeks	14 Weeks	T Values for Difference Between Drug and Placebo Group in Rate of Change		
					T†	N‡	p§
Similarities	Drug	3.12	6.12	6.50	14	12	0.05
	Placebo	4.00	5.00	4.25			
Digits Forward	Drug	4.87	5.12	5.12	9	7	0.40
	Placebo	5.00	5.38	5.50			
Digits Backward	Drug	2.75	2.38	2.75	18.5	9	0.88
	Placebo	2.62	3.12	2.62			
Block Design	Drug	7.75	7.00	9.00	8	10	0.05
	Placebo	6.75	8.00	5.75			
Porteus Maze	Drug	5.43	5.43	5.37	36	13	0.82
	Placebo	5.31	5.56	5.56			

* Tabled values are mean scores.
† Wilcoxon's matched-pairs signed-ranks test.
‡ Number of comparisons, excluding ties.
§ Two-tailed test.

previously obtained distributions of trial difference scores. Again, the Wilcoxon test was used for these comparisons. The results are presented in Table 1. It was found that the drug group improved significantly in its performance relative to the placebo group on Similarities and Block Design. No difference in the relative rate of change was found on the Digit Span or the Porteus Maze tests.

Each patient was rated independently by three raters (ward aides and nurses) who had known the patient for at least a month. In analyzing the reliability of the ratings, a rank order coefficient of correlation technique was used (5). The average intercorrelation of the ratings at pretest was .70. Table 2 gives the mean rating of all raters for the two groups at pretest, eight weeks, and 14 weeks. The same method of analysis was applied to these ratings as was used in analyzing the test changes. The placebo group improved significantly ($p = .02$), whereas the drug group did not ($p = .72$). The relative rate of change of the placebo group was significantly greater than the drug group ($p = .03$).

TABLE 2

*Hospital Adjustment Scale Scores for Drug and Placebo Groups**

Group	Pre-Test	8 Weeks	14 Weeks	T Values for Difference Between Drug and Placebo Group in Rate of Change		
				T†	N‡	p§
Drug (N = 13)	54.9	53.0	51.8	59	22	0.03
Placebo (N = 13)	59.5	61.7	67.2			

* Tabled values are mean scores.
† Wilcoxon's matched-pairs signed-ranks test.
‡ Number of comparisons, excluding ties.
§ Two-tailed test.

DISCUSSION

The results indicate a significant improvement of the drug group in intellectual performance on Similarities and Block Design tasks relative to the placebo group. On the other hand, the placebo group showed a greater degree of improvement on a rating of adjustment to the hospital situation. Intellectual gains need not necessarily be seen as producing a better adjustment. In fact, one might anticipate increased resistance to a passive participation in hospital routine and requirements with intellectual changes of a positive nature. In any event, changes in adjustment were not evident with the drug group during the period of time under study.

It should be noted that the group studied was an elderly group and included several deteriorated patients. It was not possible to do an analysis of the high and low scoring individuals because of the small number of subjects available, but inspection of the data suggested that the greatest degree of relative improvement in Similarities and Block Design tasks was in the more intact patients.

Further research with this vasodilator seems highly indicated, particularly with patients showing early signs of cerebral arteriosclerosis.

SUMMARY

Vasodilan (isoxsuprine hydrochloride) was evaluated with 27 chronic cerebral arteriosclerotic patients matched on age and hospital adjustment. Twenty of these patients were also evaluated and matched on a battery of psychological tests. A double-blind study was carried out with re-evaluations at eight and 14 week intervals. Results indicate a significant improvement of the drug group in intellectual performance on Similarities and Block Design tests relative to the placebo group. These positive changes in the drug group were, however, not associated with an improved adjustment to the hospital routine. Further research with this vasodilator seems highly indicated, particularly with a less chronic population.

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LEUKOPENIA WITH DIPHENYLHYDANTOIN

JOHN F. KURTZKE, M.D.[1]

Diphenylhydantoin sodium has deservedly been the mainstay in the treatment of convulsive disorders. One of its greater advantages has been its freedom from major toxic effects. In the usual textbooks little mention is made of alterations in blood count with Dilantin. However, 12 reported cases of megaloblastic anemia (6) and one of microcytic anemia with exfoliative dermatitis and lymphadenopathy (9) have been documented. Leukopenia also has been recorded be several observers. Aring and Rosenbaum (1) presented a child with agranulocytic angina occurring two months after beginning Dilantin 0.5 gms. average daily dose. A 17-year-old girl had a white count of 1500 with 10 per cent neutrophils three weeks after institution of Dilantin 0.3 gm., according to Dickerson (3), who also found "a small number" of 211 children to show leukopenia of mild degree with this agent. Schoemperlen (8) reported a 16-year-old boy with 2900 white count (12 per cent neutrophils) one month after diphenylhydantoin 0.3 daily was started. Bray (2) stated that "granulocytopenia or hepatitis associated with eosinophilia are rare allergic reactions (of this drug)." Livingston (6) noted several instances of transient leukopenia. Fetterman (5) and Rioch (7) each recorded a single instance of leukopenia. In all cited cases the abnormalities disappeared upon cessation of the drug; in the severe ones blood transfusions were also given.

METHODS AND MATERIAL

From 1956 there has been at the Coatesville Veterans Administration Hospital an average population of some 150 patients receiving Dilantin; these comprised about 100 chronic patients hospitalized for many years plus at any one time an additional 30 to 60 patients present for periods of weeks to months. For a full two year period monthly blood counts were done on 120 patients. All patients encountered in the four-year period evaluated had had two or more blood counts. Counts on all 22 patients with Dilantin toxicity however were examined in each instance. An arbitrary limit of 4000 white blood cells was set as the criterion for leukopenia. Of the entire group, seven patients with leukopenia not obviously due to other causes were encountered. An additional patient treated previously is also reported because of the severity of the blood changes present. Table 1 summarizes the pertinent data, and brief abstracts follow.

Case #1: This is a 53-year-old white female on Dilantin 0.3 and phenobarbital 0.12 for an unknown number of years, who developed a severe pancytopenia which subsided with withdrawal of both drugs. Transfusions were necessary since she was acutely ill, but there was continued maintenance of clinical and laboratory improvement. (This patient was seen in 1952 at another hospital.)

Case #2: A 31-year-old white male receiving Dilantin 0.3 and phenobarbital 0.03 for four years for mixed seizures, presented with gingival hyperplasia and ataxia as well as leukopenia, all of which subsided after exchanging these agents for primidone.

Case #3: A white female, 37 years old at the onset of her seizure state, had been hospitalized for psychosis intermittently for 16 years. A prefrontal lobotomy, electroshock, nasopharyngeal carcinoma, and intensive irradiation were all possible etiologic factors for the seizures. Dilantin, usually at 0.3 gm. daily, was given for almost six months before leukopenia was noted. This disappeared about one month after the drug was discontinued.

Case #4: This 35-year-old Negro male, with grand mal for 15 years, purportedly received Dilantin 0.8 and phenobarbital 0.12 for at least six months before admission, having taken these

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TABLE 1

Summary of Data Discussed in Text

Case	Diagnosis	Current Rx	Duration	Date of Discont.	Minimal PMN	Representative Counts (date, wbc, % PMN)
1	Akinetic fits	D 0.3 Ph 0.12	X years X years	9/14/52 9/14/52	1480	9/15/52 9/16 9/24 9/25 10/22 2250 2500 5800 6200 9300 60P 65P 74P 69P 6B Hg 6 Hg 6 Hg 11.8
2	Psychomotor* & grand mal	D 0.3 Ph 0.03 Pr 0.5 begun 4/30/59	4 years 4 years	5/2/59 5/2/59	1570	4/22/59 5/4 5/18 5/26 3940 3750 4800 7100 50P 42P 60P 60P
3	Grand mal secondary to metastases or radiation fibrosis	D 0.3 Pr 0.75 begun 3/1/57	5 months	3/1/57	1460	11/9/56 11/15 2/26/57 3/26 4/10 4600 8000 3700 3750 6250 47P 60P 55P 39P 54P
4	Grand mal*	D 0.8-0.6-0.4 Ph 0.12-0.09 (Pr 0.5 begun 10/8/59)	6 years 6 years	10/8/59 10/8/59	1310	6/15/59 7/20 9/9 9/25 10/13 10/21 4650 5450 4150 3750 5000 7750 40P 30P 51P 35P 28P 51P
5	Trauma*	D 0.5 Ph 0.09 (to 0.06 9/5/56) Chl 0.6	1 month 4 years 2 years	9/5/56 (to D 0.4) 10/29/56 (to D 0.1) 9/13/56	1280	8/30/56 9/6 9/10 9/11 9/12 9/13 9/14 5400 14700 2850 3350 9900 13600 8950 88P 71P 45P 12P 16P 39P 74P 6B 50B 60B 35B
6	Decerebrate due to trauma	D 0.4 to 0.3 S 1.0	6 months 10 days	12/27/56 12/27/56	1430	11/26/56 12/18 12/19 12/26 1/7/57 1/10 12500 20700 13500 3400 9950 14500 74P 81P 60P 42P 39P 65P 8B 4B
7	Post-shock fits	D 0.3 to 0.2 (11/8/56) Chl 900	4 years 2 years	2/8/57 (to 0.1) 2/25/57 2/19/57	1350	1/10/59 2/19 2/20 2/21 2/26 2/27 2/28 5650 3750 3350 2700 5550 6100 5150 58P 64P 64P 50P 53P 75P 68P
8	Psychomotor	D 0.2 (1/58—2/58) D 0.1 (3/14/58) to D 0.4 (3/22/58) Ph 0.1 (3/14/58) to 0.06 (3/22/58) to 0.12 (5/2/58) Pr 0.5 (4/17/58) to 1.0 (4/30/58) to 0.5 (5/2/58)	1.5 months	5/8/58	1700	1/7/58 4/4 4/23 5/23 5/28 6/9 5500 5350 4150 3150 6100 7500 65P 55P 50P 54P 57P 50P

Chl, Chlorpromazine; D, Dilantin; Ph, Phenobarbital; Pr, Primidone; St, Streptomycin; B, Band; P, Polymorphonuclear.
* Toxic.

drugs for six years. The cited dosage was administered and patient showed a febrile delirium, ataxia and nystagmus. Dosage was lowered to 0.4 Dilantin and 0.09 phenobarbital, but leukopenia was noted one month later, whereupon Dilantin was stopped, primidone begun, and phenobarbital continued. With this the blood count reverted to normal.

Case #5: A white male, 26 at the time of his leukopenia, had become toxic on Dilantin 0.3 after six months of therapy four years previously. Mesantoin controlled his traumatic fits thereafter until an acute meningoencephalitis took place in 1956, whereupon Dilantin 0.5 for one month was exchanged; at this point a leukopenia was found which subsided concomitant with dose-reduction. On two later occasions in the ensuing three and one-half years seizures took place when his Dilantin 0.1 daily was withdrawn, although he was perfectly controlled on this single capsule.

Case #6: A 28-year-old white male was admitted in decerebrate condition four months after a motorcycle accident. After five months ingestion of Dilantin 0.4 and then one month at 0.3, a moderate leukopenia developed which promptly disappeared when the drug was discontinued.

Case #7: This 36-year-old white male had received Dilantin for four years for seizures probably associated with electroshock therapy. Dosage was 0.3 daily until three months before the leukopenia, then 0.2 and, at the time of an upper respiratory infection with low white count, 0.1 for the prior two weeks. This was discontinued and leukopenia promptly cleared. However, he was also receiving chlorpromazine for two years, which was stopped a week before Dilantin at the onset of the sore throat.

Case #8: A 60-year-old Negro with psychomotor seizures developed a moderate leukopenia two months after Dilantin 0.4 was instituted. A repeat course at same dose a year later was characterized by mild ataxia, persisting until this agent was omitted, but without alteration in blood count.

DISCUSSION

The first patient seen, who was severely ill due to the myelophthisic state, was the only one who also showed anemia. None of the cited cases, and none of the other patients followed had any alteration in red cells or hemoglobin. The severity of the leukopenia was not marked. The eight patients cited had counts under 4000, but only three were under 3000 (#1, 5, 7). With the minimum count each patient had cells of the polymorphonuclear series ranging from 1280 to 1700. While the patients included represent a paucity of idiopathic grand mal, it is difficult to ascribe these blood changes to their underlying illnesses.

The dose and duration of Dilantin had no apparent relation with the development of leukopenia. Four patients showed the blood changes with only 0.3 gm. of the drug, a fifth was reduced to 0.3 from 0.4 five weeks previously, one each received 0.4 and 0.5 gm., and in one dose was reduced from 0.8 to 0.4 gm. for two months before significant leukopenia appeared. The duration of use varied from at least eight years to as little as one month. Two patients showed leukopenia after one (#5) and 1.5 (#8) months, one (#3) after five months, one (#6) after six months. The rest had received the agent for four years or more.

Concomitant medication was present in all but one patient (#3). The use of phenobarbital (five patients) was coterminal with Dilantin in two (#1, 2); it was continued without change in one (#8), and had been lowered in two (#4, 5) over a month before the leukopenia. Chlorpromazine was used in three patients (#4, 5, 7), being stopped in one (#7) at the time of the leukopenia, in one (#5) after the leukopenia had cleared, and there was no change in dosage for the third. Only one patient (#8) was receiving an additional anticonvulsant (primidone) at this time, which was lowered from 1.0 gm. to 0.5 gm. at the time of the leukopenia. Patient #6 was receiving penicillin, streptomycin, and nitrofuradantoin at the time of his leukopenia, but only the streptomycin was discontinued then on the 10th drug day, and was later given again for one week. It was concluded therefore that the other medications, with the possible exception of chlorpromazine in patient #7, were not responsible for the leukopenia. No cause other than medication was obvious in these patients.

Three patients (#2, 4, 5) showed clinical

Chl, Chlorpromazine; D, Dilantin; Ph, Phenobarbital; Pr, Primidone; St, Streptomycin; B, Band; P, Polymorphonuclear.
* Toxic.

evidence of Dilantin toxicity, the first two at the time of the leukopenia, and on dosages of 0.3 gm., and 0.8 to 0.4 gm., respectively. The other patient had become toxic on 0.3 gm. Dilantin four years previously, and the leukopenia developed acutely after exchange of Dilantin 0.5 for Mesantoin 0.5. On the other hand, 19 additional patients with Dilantin toxicity (nystagmus and ataxia) were seen in this period who did not show alterations in blood count. It should be noted that three patients (#1, 5, 8) were bed-ridden due to their basic illness, two (#3, 6) respectively moribund and decerebrate, and one (#7) severely psychotic. Mild ataxia could not be ruled out in any of these patients therefore, and the most profound Dilantin toxicity could have been present in two without its recognition. Patient #8 did indeed show mild ataxia of gait upon a repeat course a year after the leukopenia. This suggests that the leukopenia may be a true toxic effect of the drug rather than an idiosyncrasy. It may well be that for most patients the level for blood changes is higher than the level required to produce ataxia. It is common experience that there is considerable individual variation in the response to Dilantin, in terms of both anticonvulsant activity and the usual type of toxicity, and small alterations of dosage in some patients can produce either state. It is reasonable that the blood changes may be of similar import. For all of these effects, the most logical hypothesis is a differing mode of metabolism with varying blood and tissue levels. In this respect, Dill *et al.* (4) found marked differences in blood levels of four patients maintained for long periods of time on Dilantin 0.400 daily, with a concentration ranging from 0.9 to 10.5 micrograms per ml.; they noted that each individual had a practically constant level throughout the single twenty-four-hour test period.

That leukopenia with Dilantin has been so rarely witnessed may have several explanations in addition to the hypothesis that the present cases merely represent coincidence and not cause and effect. Awareness of the possibility is not universal: patient #2 had leukopenia "of unknown cause" noted in a hospitalization elsewhere shortly before his present admission. There is some evidence (Patients #4 and 5) that leukopenia occurs on doses higher or more prolonged than those which will produce ataxia in the same patient. This, of course, would preclude its observance. In addition it certainly is possible that this is a transient and self-correcting blood change, although this is not considered very likely. That the state can be serious is seen by the near-fatal reaction of the first patient. The incidence of leukopenia was about two per cent in the total series (seven of 350; patient #1 excluded), but for the patients with Dilantin toxicity approximately 14 per cent (three of 22). Only one patient (#3) was discovered by means of monthly routine counts, hardly productive for the some 3000 examinations entailed by this procedure.

SUMMARY

Eight patients are presented in whom leukopenia developed while receiving diphenylhydantoin. The leukopenia subsided rather promptly upon cessation or reduction of this drug in each instance.

The total white counts in these patients were under 4000 in five, and less than 3000 in the other three. In all the polymorphonuclear count measured 1280 to 1700 per cu.mm. at this time.

Concomitant medication included phenobarbital in five patients, chlorpromazine in three, antibiotics in one, and primidone in one. Only one patient was on no other medication. However, in these cases, phenobarbital was discontinued at the pertinent time in only two patients and chlorpromazine in one, and it was concluded that these other drugs given were not responsible for the leukopenia.

No relationship between leukopenia and

amount or duration of diphenylhydantoin was apparent.

Suggestive evidence for leukopenia as a true toxic effect of Dilantin was seen in the presence of nystagmus and ataxia in three of these eight patients.

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MASOR, NATHAN. *The New Psychiatry.* Philosophical Library, New York, 1959. viii + 155 pp. $3.75

This condensed volume seems conspicuous by the choice of its title. In brief, it reflects Dr. Masor's dissatisfaction with the state of contemporary psychiatry. More than half of his book constitutes a review of concepts and theories as the author conceives of them. The last third is dedicated to the writer's own preference and describes a combined approach of drug treatment and psychotherapy. On the basis of our still scant, theoretical knowledge—and even his references are eclectic, to say the least—a new method or procedure under the name of "Psychocrinology" is evolved which subsumes a connection between disturbed endocrine homeostasis and mental dysfunction. Finally, case illustrations are presented which are distinguished not only by their brevity but also by a certain degree of unconcern for just those psychological variables which are admittedly inherent in all cures. Thus, an acrimoniously critical attitude toward the more formalized psychotherapies, and in particular toward psychoanalysis, seems to stand on slender feet indeed.

It is by no means a secret that classical psychoanalysis developed an ever-changing theoretical system on the basis of clinical observations, and that its founder's greatest claim to immortality could be seen in his never-ceasing readiness to re-evaluate, reformulate and revise his own postulates. Nobody denies certain aspects of defensiveness when it comes to a validation of data in terms of the "scientific method."

As has been acknowledged in Europe throughout modern times, psychiatry finds itself in a borderland between the humanities and the applied natural sciences. Maybe functions may be scrutinized in terms of experimental psychology, yet emotional and thought processes do not lend themselves to reproduction or prediction as easily as biochemical observations. Any attempt to correlate physiological and psychosocial performance may be doomed to frustrating failure as long as one ignores different and separate systems of inquiry. Neither the author's literary skill nor his considerable amount of information can conceal his unawareness of such a dilemma.

Klaus W. Berblinger

GOMBRICH, E. H. *Art and Illusion: A Study in the Psychology of Pictorial Representation.* (Bollingen Series XXXV 5) Pantheon, New York, 1960. xxxi + 466 pp., illus. $10.00

Professor Gombrich, an art historian and scholar in the grand tradition, has produced a work of striking virtuousity. Along with a profound knowledge of the broad currents and detailed particulars of the history and technical problems of the visual arts, he displays an easy familiarity with a wide range of psychological problems and concepts. He is aware of both the applications and the limitations of current theories of psychic functioning in elucidating the problems of esthetics and creativity which have agitated philosophers since the time of Plato. Most striking in this imaginative, admirably written and beautifully illustrated exposition, is the facility with which the author transposes ideas from one discipline to the other, carrying the reader along with a mounting sense of illumination.

Ernst Kris, with whom Dr. Gombrich had an extensive and mutually enlightening association, was particularly impressed with the limitations of existing psychological theory (psychoanalysis not excepted) in making significant contributions to the multidimensional problems of artistic creation and style. "Two such limitations", he said, "deserve our particular attention. The firs

concerns mainly the individual; the second, his relation to his medium and its potentialities under given historical conditions. . . . Historical and social forces shape the function of art in general and more specifically that of any given medium in any given historical setting, determining the frame of reference in which creation is enacted. We have long come to realize that art is not produced in an empty space, that no artist is independent of predecessors and models, that he no less than the scientist and philosopher is part of a specific tradition and works in a structured area of problems. The degree of mastery within this framework and, at least in certain periods, the freedom to modify these stringencies are presumably part of the complex scale by which achievement is being measured. However, there is little which psychoanalysis has yet contributed to an understanding of the meaning of this framework itself; the psychology of artistic style is unwritten."

The present book does not concern itself with the first of these problems, that of the individual artist, except in incidental comments and quite apart from the main preoccupations of individual psychology. It is in his striking familiarity with the "framework" alluded to by Kris, that Professor Gombrich has begun the complex task of writing a "psychology of style".

Beginning with Constable's notion that "painting is a science" and "should be pursued as an inquiry into the laws of nature", Gombrich shows that mimesis, the illusion of the natural, in art could not be accomplished by the pre-Hellenic ancients because cognition had not been separated from perception. Thus they tried to render all that they knew rather than what they saw; "making came before matching." Primitive art relies upon schemata in much the same way as the art of children. The Greek revolution in art consisted of the first systematic attempts at "matching." The reproduction of sensory impressions of the world of objects through the "illusionist tricks" of light and shade, modelling and perspective gave to the western world the impetus that led to the magnificent traditions of Renaissance, Romantic and Modern painting. Not only has the "illusionist" painter taught generations of mankind what to look for in the outside world, but he has also revealed some of the mysteries of the process of seeing itself. The scanning and feedback mechanisms by which recognition and identification take place; the importance of "mental set" and anticipation in seeing what is there (as well as what is not there) was first intuitively discovered by painters and draftsmen. Modern experimental psychology in the field of perception has taken many investigative hints from "illusionist" painting.

In the last, and in this reviewer's opinion, the most brilliant portion of the book, Gombrich traces the transition from representational to expressive painting, a step in which the caricaturists, cartoonists, impressionists and finally the expressionists all played contributory roles. In his inimitable way the author shows that the very attempts to match nature inevitably led to the recognition that there is no such thing as an "innocent eye." Even the greatest skill in pictorial representation must inevitably lead to the discovery that the inner world of the artist's imagination, memory, personal preferences and the effects of "predecessors and models" in Kris's terms, consciously or otherwise, will produce deviations and personal distortions of the rendered image. Traditional attempts to minimize these distortions are finally diverted by the recognition that their exploitation leads to new artistic dimensions. The impressionists' incorrect theories of perception led nevertheless to some of the world's greatest painting. The main impetus to modern expressionist art, has come, however, according to Gombrich, from caricaturists like Daumier, who discovered that physiognomic mimesis is best portrayed not by copying nature but by radically altering features, their proportions

and method of definition; in short, by distortion and the introduction of ambiguity so that the observer becomes a partner in the creative process. In its final phases expressionist painting has sought to become the official art of intrapsychic representation, of the fantasy and the dream. In a most penetrating discussion of this latest phase in the evolution of artistic tradition, Gombrich deftly divests expressive and abstractionist painting of its pseudopsychological claims to being the "art of the unconscious." His use of linguistic analogies to comprehend these art forms in terms of the experience of synesthesias and the ubiquitous tendency to find equivalent relationships which cross sensory modalities, must be read to have its subtlety appreciated.

These comments skim the surface of the rich, carefully elaborated and complexly integrated argument of the book. It would be superfluous to say that they do not do it justice. One might wish that Professor Gombrich had been able to say something more about the individual artist and the creative urge than is encompassed by his discussion of the "Pygmalion" theme. His wisdom, however, in avoiding excursions into the field of psychopathology and other areas that are not strictly related to his unique competence must be appreciated and respected.

In this reviewer's opinion, *Art and Illusion* is one of those rare creations that bids fair to be a classic before the ink is dry and a source of "interdisciplinary" inspiration for many years to come.

Victor H. Rosen

THIBAUT, JOHN W. AND KELLEY, HAROLD H. *The Social Psychology of Groups.* Wiley, New York, 1959. xiii + 313 pp. $7.00

The Social Psychology of Groups constitutes a special kind of innovation in social psychology. It presents no new data, provides no new illuminating insights about behavior, resolves none of the standing problems of social psychology or group behavior. Yet it does a task which is equally as important as all of these. This might be termed a task of "synthesis" or "reorganization" or "reconceptualization." In essence, Thibaut and Kelley introduce a single, simple set of concepts, and reinterpret all aspects of small group behavior in these terms. The work follows logically, in the development of a theory of group behavior, George Homans' *The Human Group.* Homans examined diverse empirical studies and extracted from them a set of generalizations about behavior of groups. Thibaut and Kelley go a step further, by developing a set of explanatory concepts, using them to explain the generalizations. The task is accomplished with less success in some areas of group behavior than others, but with considerable success overall.

The basic concepts in this synthesis are rewards and costs—concepts which link social psychological theory with fields as diverse as learning theory in psychology, with its ubiquitous rewards and punishments, and economic theory, with the pervasive price, cost, and profit of economic transactions. The authors concern themselves throughout the book with one facet of social psychology, that of *social interaction.* Appropriately, then, the book begins with interactions between two persons, and a reinterpretation of such interactions in terms of the psychological rewards they provide to each member, and the psychological costs incurred by each member. The conceptual tool which they introduce in Chapter 2 and use throughout the book is an "outcome matrix," showing the rewards minus costs for each person consequent upon each possible action of each person. Their basic postulate is one which links up the *determinants* of behavior with the *rewards and costs* consequent upon such behavior. They propose that the behavior will be largely determined by these rewards and costs. As the authors point out, this can be so only when expectations about

rewards and costs are reasonably accurate. Thus their theory is more applicable to transient or unstable situations.

The first two-thirds of the book concentrate upon the dyad, first examining general empirical results in the maintenance of relations (Chapters 3 and 4), then turning to formation of the relation (Chapter 5), to reference-group and comparison-level phenomena (Chapter 6), to power and control (Chapter 7), norms and roles (Chapter 8), task-oriented pairs (Chapter 9), and nonvoluntary or coerced relations (Chapter 10). Then it turns to larger groups, and discusses a number of these same issues for three-person and larger groups. The pattern of each chapter is similar: application of the reward-cost framework to the area of behavior under consideration, a review of empirical results in the area, and a reinterpretation of these results in terms of the reward-cost framework.

There are several ways such a reconceptualization as this can be judged. If it does nothing more than bring theory in a given area in closer contact with theory in adjacent fields, this is some value. The present book certainly does that, for Thibaut and Kelley's concepts certainly make social psychological theory compatible with the work of learning theorists; and what may be equally important, establishes a connection with economists' and game theorists' recent ventures into the area of social interaction. Merely by using the same kind of "payoff matrix" that game theorists have grown accustomed to, this book makes social psychological theory available to the game theorists.

Another test of such a work as this lies in the non-obvious deductions or implications which stem from it. By this test, certain parts of the book are clearly better than others. As an example of the better, in Chapter 3 (p. 43), the authors assume that an individual needs social support for certain values expressed in a relationship (*i.e.*, finds his partner's expression of those values rewarding). With this assumption, and with recognition that it *costs* an individual less, psychologically, to express values which he in fact holds, the authors derive a frequently-observed result: relationships in which there is a similarity of values will tend to persist more than those in which the members have different values. Quite simply, each member is able to reward the other at little cost to himself. Less fruitful is the discussion of power in pair relations (Chapter 7), and a discussion of nonvoluntary relations (Chapter 10). In both of these chapters, the reformulation provides little in the way of non-obvious deductions.

Some social psychologists will be immensely pleased at this work, for it provides a framework to be built upon, connecting up diverse areas of group behavior. Others will find it too behavioristic, too coldly rational or hedonistic (despite the authors' explicit rejection of a hedonistic or calculating interpretation of their theory), too lacking in analysis of motives, feelings, and sentiments held by group members. Despite the division of opinion, this reviewer suspects the book will have a great impact upon theory and research in social psychology. I believe it will be seen, some years hence, to mark a beginning point in a highly productive theoretical direction.

James S. Coleman

HARRIS, HARRY. *Human Biochemical Genetics.* Cambridge University Press, New York, 1959. viii + 310 pp. $7.00

In the closing paragraph of this excellent volume, the author states, "It has become possible for the first time to consider inherited differences between human beings in terms of the chemical structure of particular macromolecules and the significance of this for future work can hardly be overemphasised." The documentation of this claim occupies the attention of the author throughout the book. It is now a basic tenet of modern genetic philosophy that gene action will be explicable in terms of gene control of

specific metabolic steps, just as the biochemist asserts that biosynthesis proceeds by a series of specific, relatively simple chemical steps. The analogy is essentially complete. Harris thus considers an array of human metabolic variants whose altered synthetic or degradative activity reflects altered gene function.

By invoking the "father" of biochemical genetics, Garrod, with an examination of his classic study of alkaptonuria, Harris initiates the discussion of the role of gene substitution in "inborn errors of metabolism." The author aptly points out that this terminology is of questionable accuracy: there has been an unfortunate tendency in recent years to dub altered metabolic pathways under gene control, "metabolic errors." As recent studies of the apparent selective advantage enjoyed by individuals displaying the sickle-cell trait in malarial regions indicate, a so-called metabolic "error" (in this instance an altered hemoglobin molecule) may only be an error in certain environments. These studies stress the necessity for specification of the milieu before inferring the existence of a metabolic *fault*. Galactosemia provides another example. Individuals possessing the "abnormal" gene in double dose (homozygous) display the characteristic pathological distrubances of this condition. Yet, in an environment lacking glactose, the galactosuria and galactosemia disappear and the other stigmata are frequently markedly relieved. On the other hand, it is apparent that variation between individuals *vis-a-vis* a particular metabolite need not imply a displacement in normal function. Although there are sharp and inherited differences in the electrophoretic mobilities of serum haptoglobins among humans, there has not yet been observed any correlation of a particular haptoglobin pattern with specific disease states, although the haptoglobin *level* may be markedly elevated in some disorders.

Various aspects of the formal genetics of man are considered at the outset. This should help forestall the all-too-frequent problem of unfamiliar genetic terminology A refreshing examination of the concept o dominance is included. Gene action, includ ing the role of the Watson-Crick hypothesi of the structure of DNA, is considered in a separate chapter; but it is clear throughou the book that the role of the gene in th ontogeny of the clinical patterns discussed is foremost in the author's attention.

Chapters are devoted, respectively, to amino-acid metabolism; carbohydrate metabolism; the hemoglobin variants and their extraordinary theoretical significance; certain of the blood groups and blood-group substances; the plasma proteins; and a single chapter devoted to miscellaneous inherited disorders, including the porphyrias, gout and hyperuricemia, hypophosphatasia, diabetes insipidus, and others. The conditions considered are admittedly selected, but advisedly so: Harris has not fallen into the unfortunate trap of a mere recitation of clinical manifestations of a number of conditions with a statement of their mode of inheritance, but has taken pains to present and analyze the evidence for the inherited basis of the condition, and to include observations on the significance of the entity in terms of genetic theory.

As L. S. Penrose points out in his foreword, "In presenting this well-balanced and learned account of the subject, Dr. Harris has done a valuable service to medicine, to biochemistry and to genetics. I have much pleasure in drawing the attention of workers in these subjects to this book, for it can open a new world to them." This reviewer is happy to agree with Professor Penrose, and to add only that this work may well augment mutual understanding among the disciplines mentioned.

William J. Young

DEUTSCH, FELIX, ED. *On the Mysterious Leap from the Mind to the Body*. International Universities Press, New York, 1959. ix + 273 pp. $5.00

This book presents a symposium on the conversion process and the formation of the conversion symptom. With few exceptions, the contributors and the ideas derive from a workshop of the Boston Psychoanalytic Society and from a panel presentation, by the same group, at the meetings of the American Psychoanalytic Association in May, 1958.

The form of presentation is unusual in that a particular development and extension of the concept of conversion by Dr. Felix Deutsch is the central thesis of the majority of the contributors. As Dr. Deutsch puts it in his introduction, "Their contributions, in which they join me in the validation of my concept of the conversion process, belong to the main content of this book."

An initial discussion by all participants of the idea of conversion as "a mysterious leap" is followed by a survey of Freud's writings on the conversion symptom (Deutsch and Semrad). This is followed by three papers by Deutsch, the most important of which and the most difficult to understand is "Symbolization as a Formative Stage of the Conversion Process."

Thereafter, there are six papers of varying interest illustrating the application of Deutsch's concept of the conversion process. Ludwig presents a discussion of identification in the conversion process and Silverman discusses the role of aggressive drives. Of particular interest for its clinical material is a paper by Mann and Semrad on conversion as process and symptom in psychosis. The varieties of meaning that conversion has for these different authors is exemplified in the suggestion by Mann and Semrad that ego development "is the observable consequence of the conversion process" (p. 154). Dr. Menzer-Benaron is the sole contributor to this volume who introduces physiologic and endocrinologic concepts in her paper, "Psychobiologic Study of the Conversion Process in Women." Weinberger's discussion of the conversion process in male homosexuality and to a greater degree, Mushatt's discussion of loss of sensory perception in determining choice of symptom, belabor the reader with so many stereotyped psychodynamic formulations as to obscure the freshness and the vividness of their clinical discussion.

Both at the beginning and the end of the book there is a discussion by members of the panel who are also joined by Stanley Cobb, Henry M. Fox and Avery Weisman. The pertinent criticisms of Deutsch's presentation and thesis are made by these authors.

The model of conversion offered by Deutsch is not easy to delineate in brief and understandable fashion. In essence, it is that the symbolization of objects in the external world can be referred back to various parts of the body and effect changes or influence physiologic functional activity of the organ. "The physiologic functions of those body parts which have become the representations of these symbolized objects are for this reason modified on account of the process of symbolization." This is only the final step in a hypothetical process which starts from the fact that "the sense of reality originates from the projection of sensory perceptions of one's own body on to objects outside of it, since external objects are perceived as if severed from the body and lost. This separation leads to the continual wish to restore the loss of bodily wholeness." Symbolization reunites outside objects with the body and thereby alters physiologic function.

The critical issue, of course, is in the postulate which assumes the alteration of physiologic function by this process that Deutsch calls "retrojection": The contributors find no difficulty in explaining by this process such symptoms as a pulseless foot (Deutsch, p. 63–64), carcinoma of the larynx (Ludwig, p. 107), fibroids of the uterus and "growth in her right breast" (Silverman, p. 129). In the same vein, Mushatt suggests (p. 228) that fantasied incorporation by a male patient of his father's penis was associated with the finding, at operation, of "a relatively large fibrous nodule" in the scar of a duo-

denal ulcer. In a totally different vein, however, Menzer-Benaron (p. 180) suggests that ovulatory menstruation is "a complete undoing of the conversion process."

These examples, while no doubt unfairly torn from their context, illustrate the fact that Deutsch's conception of conversion is, for this reviewer, so all-encompassing and so diffuse as to become meaningless. Once the fundamental premise has been accepted, *i.e.*, that restoration *via* fantasy and symbolization of wholeness of the body also alters the physiology of various parts of the body involved in symbolic processes, there is no transaction or energy exchange that may not be termed "conversion." As Gifford states, "Dr. Deutsch has extended the conventional concept of conversion to include almost every phenomenon in which an interrelationship exists between psychic process and bodily representations." Hence, conversion is made equivalent to existence. As Weisman states, this view of conversion "may be in danger of meaning all things to all men."

In all fairness, it should be stated that this book will interest many psychoanalysts, particularly for its presentation of case material. Furthermore, by pushing the concept of conversion to an extreme, the symposium unwittingly underlines the value of careful delimitation of meanings. The chief deficit of the theory presented by Deutsch is that it explains too much and fails to recognize the need for intermediate links and relationships that do not involve symbolism.

Clinical observation has established that conversion symptoms may occur in a variety of different character structures and ego situations. A need to dissociate the conversion symptom and the conversion mechanism from the so-called "hysterical" personality has been urged by Chodoff, Rangell, Ziegler, and others. Reich's work on "Character Analysis" long ago pointed out how unconscious motivation and conflict can be short-circuited into facets of character structure, symptomatic acts, mannerisms, posture, etc. While not symptoms in the ordinarily accepted sense, many items enumerated by Reich as part of character "armour" represent true conversion phenomena.

Deutsch and his collaborators have every reason to urge consideration of bodily manifestations of the more primitive or archiac drives. Their presentation, however, ignores many facets of development in more recent ego psychology on the one hand and certainly ignores the need for physiolcgical understanding on the other. The concept of conversion offered in this volume appears to this reviewer to be an intellectual cul-de-sac,—stifling rather than promoting fresh observation and research.

Eugene Meyer

JESSNER, L. AND PAVENSTEDT, E., EDS. *Dynamic Psychopathology in Childhood.* Grune and Stratton, New York, 1959. xi + 315 pp. $8.75

This volume, edited by Lucie Jessner, M.D. and Eleanor Pavenstedt, M.D. has as contributors fifteen well-known research workers and clinicians in psychiatry, psychology and pediatrics.

The first chapter, by Helene Deutsch, "A Two Year Old Boy's First Love Comes To Grief," was originally published in 1919, this being the first translation in English. It describes fully the little boy's reactions during the nine days following the departure of his nurse.

"Prediction and Psychological Theory," by John D. Benjamin, is a comprehensive and very interesting chapter. In the introduction the author states that it is one of the apparent paradoxes of psychoanalysis that it is so rich in explanatory propositions but so poor in attempts to demonstrate hypothesized relationships between variables through predictions and control. Several long-term and a few short-term developmental predictions are made, aiming primarily at validation of the method. This is a fascinating piece of research that does not warrant the apologia with which the author concludes.

Drs. Julius B. Richmond and Earle L. Lipton write on "Some Aspects of the Neurophysiology of the Newborn" and their implication for child development. They present overwhelming proof that more studies in this area are needed. The chapter offers interesting observations on neonates' autonomic activities. It also presents the divergent reactions of thirty-two newborns to thirteen different stimuli. Of great interest is the new study that the author is undertaking by filming the parent-infant patterns of behavior in the obstetrical ward. Very little has been published with validating data on this very crucial period.

The next chapter, entitled, "Emotional Factors in Children With Rheumatoid Arthritis," is a preliminary report on the observation of patients, half of them hospitalized and half out-patients. This is a good interdisciplinary effort that has managed to overcome many of the difficulties inherent in such a combined effort. The Drs. Gaddim add six cases of rumination in infancy, with a description of the mothers' inadequate and immature personalities.

The paper of Dr. Eveoleen Rexford is based on the experiences and researches of the Thom Clinic in Boston, in their work with aggressively antisocial young children during the period from 1947 to 1958. They believe these children to be suffering from maturational defects. The most seriously traumatized cases suffered from primary emotional and physical deprivations during infancy.

In a group of forty-eight cases treated by Dr. Kurt Rose, using psychoanalytically-oriented psychotherapy, the pattern of delinquent acting out was curbed in at least thirty-two. His techniques included gifts from the therapist of food, drink, small articles, and in some cases a regular allowance. He found that these children were less capable of appreciating symbolic gifts than were the neurotic children. Extensive application of the Glueck Social Prediction Tables were carried out in the clinic. They correlated well with the results of clinical investigators. The most important material in the Rexford paper is the preliminary report of an eighteen month investigation of the interaction of parents and their aggressively antisocial children compared with the interaction of parents and children who suffer from inhibition and overcontrol. This paper is a valuable contribution to the literature on juvenile delinquency.

The paper by Dr. Melitta Sperling reports her experiences in the treatment of eleven children exhibiting deviate sexual behavior, utilizing her well-known method of simultaneously analyzing the mother and the child. Fragments from three cases are reported. Dr. Sperling believes that an overemphasis on inherent factors in ego development overlooks the role of actual experiences in ego and superego development. The data which she has gathered from her analysis of both the mother and her sexually deviated child tends to confirm these conclusions. Dr. Sperling's paper speaks highly for her unique method of treatment both as a means of gaining fundamental insight into basic psychopathology and as a means of therapy.

Phyllis Greenacre writes on "Focal Symbiosis," with a good clinical description and discussion of an interesting case.

Lucie Jessner, in a brief chapter, makes some observations on children hospitalized during the latency period. This is one of the most interesting and provocative chapters in the book. The author proves that in some cases an illness "may not only spur maturation but also widen the horizon, heighten sensitivity, and bring forth a greater depth of feeling, capacity for empathy and for sublimation."

Drs. Ekstein and Friedman report and interpret the meaning of play in childhood psychosis. They stress effectively the need for formalized research into the nature of the psychotic child's play, "research which would require the study not only of different stages of the illness but also would inquire into the nature of the ego organization and

its changes when certain maturation takes place." Only in this way, could we gain access to unconscious mental process and conflict as well as understanding of primitive ego organization and its developmental course in childhood psychosis.

Finally, Dr. James T. Proctor comments on the countertransference phenomena in the treatment of severe character disorders in children and adolescents.

All in all, this is a very worthwhile book that should be on the reading list of every child psychiatrist. Highly recommended.

Carola B. Guttmacher

WHYTE, LANCELOT LAW. *The Unconscious Before Freud*. Basic Books, New York, 1960. xiii + 219 pp. $4.50

Lancelot Law Whyte was prompted to write this book when he found that Ernest Jones, in his great biography of Freud, had omitted the cultural and philosophical background of Freud's thought. I am sure that Mr. Whyte was not the only reader of Jones who regretted this deficiency,—while being relieved that Jones did not feel obliged to enter a range of ideas outside his interest or competence. To demonstrate Freud's position in the development of certain European ideas is the purpose of this book, and within limits, more or less clearly indicated, the author has succeeded.

That these limits are not fully defined the title itself suggests, for this book is in fact a kind of anthology of brief extracts from philosophical writers who have made mention of unconscious mental processes,—preceded and followed by a thoughtful inquiry into the origins of these ideas and their possible consequences for the future. To a great extent Mr. Whyte's argument rests on the assumption that philosophical ideas influence and even determine the production of scientific concepts. Psychology, which remained in association with philosophy longer that the natural sciences, must have been particularly sensitive to the cultural climate, and this sensitivity may still exist. However it is likely that psychology, like the natural sciences, is at present so bound to the empirical method that its conceptual framework is self-generating. At any rate the reader will be disappointed if he expects to find here the links between the philosophers' ideas of the unconscious and the hypotheses of Freud. What he will find, in addition to the anthology mentioned above, is an appreciative and scholarly discussion of the problem presented to philosophical men by their *intuitions* of unconscious mental processes.

From this point of view Freud's discovery was a rediscovery, the statement in the language of natural science—or through analogy with natural science—of a realm of experience which had always been in some sense known. A comparison of quotations from the many authors cited reveals a remarkable similarity of their ideas over a period of nearly nineteen hundred years. Thus, from Plotinus:

> "The absence of a conscious perception is no proof of the absence of mental activity,"

to Spinoza:

> "Men regard themselves as free, since they are aware of their will and their desires, and do not even in dreams think of the causes which determine their desiring and willing, as they do not know them,"

and even Wundt:

> "This unconscious mind is for us like an unknown being who creates and produces for us, and finally throws the ripe fruit in our lap."

there is a curious sameness, so much so that one turns at times with pleasure to the rarer but more colorful quotations from poets and novelists, whose writings, as Freud also knew, have always been vehicles for the translation of unconscious experiences into communicable form. The critical reader, while fascinated by this array of examples from the philosophers, will also complain that there is no development in their ideas of

he unconscious, only a ramification of them nto the specific interests of the writers. Oddly enough, Mr. Whyte makes the improbable error of attributing an American origin to one of them, Thomas De Quincey).

What is especially noteworthy is the philosophical opposition to these intuitions, an opposition inherent in the work of Descartes, whose bifurcation of the world into *res cogitans* and *res extensa* left no room for unconscious mental activity. To Mr. Whyte he position of Descartes is crucial, since it narks the beginning of a rationalistic psychology precluding the recognition of the unconscious. Rightly Mr. Whyte reproaches Freud for his strictures against the philosophers, since he is able to marshal such an imposing roster of writers who did not deny their intuitions. Freud, as he seems himself to have known, and as both Mr. Whyte and Ernest Jones concluded, saw in his early philosophical disposition a diversion from the positivist-empiricist attitude of natural science; to his fidelity to this attitude we owe the works of his genius, and, we might add, the insufficiencies of his philosophical work. Mr. Whyte's reading of history posits a definite date—around 1600—as the beginning of the modern period in which the person is fully contrasted with the world of nature. The idea of consciousness as awareness was first put into words at that time, and it was left to Descartes to establish this concept in axiomatic fashion. While a philosophical minority continued the age-old tradition of belief in unconscious mental activity, only in the nineteenth century did the idea burst its esoteric confines and infiltrate European thought. Thus Freud, although his reading in philosophy was relatively slight, must have been prepared for his studies and his hypotheses by influences abroad in his time.

Here again the reader must follow Mr. Whyte, an eloquent and persuasive writer, with caution. The student of psychoanalysis finds out early that the unique discovery of Freud was not the discovery of the unconscious in general, but of its specific and generalizable contents, and, secondly, of the unconscious *resistance*. These discoveries took decades of work through the analysis of his patients and himself, and it is a little difficult to see how any latent philosophical conceptions influenced them,—other than the latent positivist epistemology. We have only begun during the last sixty years to realize the significance of the unconscious resistance to the perception of the unconscious contents: we have only begun to recognize among other things that the social life of man is at once the highly adaptive means of his satisfaction of unconscious needs, and the perennial target of his unconscious rebellion.

Mr. Whyte's final chapter, "The Prospect," is difficult. To this reader it afforded a promising glimpse into a new mode of conception of mental life, in which better justice is done to process and function, in place of the traditional spatio-temporal concepts which Freud inherited and transmitted.

S. A. Leavy

Erikson, Erik H. *Identity and the Life Cycle (Selected Papers)*. International Universities Press, New York, 1959. v + 171 pp. $3.00

This monograph of "Psychological Issues" brings selected papers of E. H. Erikson with an introduction by David Rapaport. The introduction puts Erikson's work on the psychosocial development of ego identity into a historical perspective as a result of psychoanalytic ego psychology. It emerged from the earlier psychoanalytic concentration on libido theory and the primary process which gradually yielded to a stronger emphasis on secondary process phenomena, defences of the ego and ego autonomy.

In the first part, "Ego Development and Historical Change," Erikson describes the stages of the unfolding of the child's identity out of the sameness and continuity of early sensual experience of the mother's body and

temperament. Erikson does not describe this dovetailing of maternal and infantile needs as a symbiosis. He retains the concept of narcissism and autoerotism in the oral, anal and phallic phase, which are gradually abandoned for the sake of acquisition of skills and knowledge during the latency period. The unconscious incestuous object choice in the Oedipus conflict is not considered by Erikson as pathogenic, but it guarantees the perpetuation of tradition. The development of ego identity according to the epigenetic principle follows an innate unfolding plan. This development is disturbed by neurotic fixations and rigid defenses against them. These fixations disturb the integration of an identity, but also contradict the expectations of social conformity to the performance level that society considers appropriate to the various levels of infantile, adolescent and adult development.

In the second part, "Growth and Crises of the Healthy Personality," Erikson finds some autonomy, as early as the first year of life, in the trust or confidence relation between mother and child. A loss of self control or overcontrol on the part of the parents elicits in the child a loss of self esteem in form of doubt and shame. Near the end of the third year, emerging out of the relaxation of trust, the child develops masculine or feminine initiative, enjoyment of competition, insistence on goals, pleasure of conquest. In the progress of initiative Erikson does not admit that a certain degree of unreachable idealism characterizes generally the standards of parents and society. The child psychologist Piaget points out that the child, due to the discrepancy in strength, skills and knowledge between himself and adults, cannot help but submit to an authoritarian morality, until he is able to form relations of equality and mutuality in preadolescence. According to Erikson, in the beginning school age the child develops industry which satisfies his need for adequacy, while shortcomings in this development leaves the child with a painful sense of inferiority. Yet Erikson's discussion of progressive versus old-fashioned education indicates that the work morality of the child in the first school years is still an authoritarian morality. The child recoils from a freedom of choice that adults expect prematurely. This is documented in the frequently quoted phrase of progressively educated children: "Teacher, must we do today what we want to do?"

Adolescence represents the period where identity is for the first time fully experienced, yet it is also the time of dangerous identity diffusion with anarchy of drives and autocracy of conscience, loss of self confidence and autonomy. If the young person remains unsure of his identity, he is deprived of the spontaneity which initiates genuine fellowship and meaningful heterosexual intimacy. If the partner is chosen to mend the unreliable self identity, intimacy becomes intrusive and dangerous. It is fought off by distantiation and isolation. A person, unsure of himself, does not dare to take on the responsibility for a partner or for the upbringing of the younger generation. As far as the young person wants to be still a child himself, he has not the surplus energy, the generosity to devote himself to the service of dependents. This lack of generosity leads to stagnation and ultimate disintegration, accompanied by disgust and despair, while the healthy development of the adult accepts the fact that his life is his responsibility.

In the last chapter of this monograph, "The Problem of Identity," Erikson introduces some features of G. Bernard Shaw's autobiography to illustrate the need for a moratorium granted to the adolescent by society to collect the variety of identity trends of a richly endowed person in a unique and integrated personality. The evolving configuration of ego identity integrates "constitutional givens, idiosyncratic libidinal needs, favored capacities, significant identifications, effective defenses, successful sublimations and consistent roles" (p. 116). Erikson describes pathographic deviations, the loss of sexual identity in the failures of intimacy

the diffusion of time perspective, the passivity of despair to the adolescent threatened by diffusion of identity. He "would rather be nobody or somebody bad or indeed dead—and this totally by free choice—than be not-quite-somebody" (p. 132).

Erikson enters into some therapeutic problems in identity crises of patients in need of what Ernst Kris called "the regression in the service of the ego." Erikson discusses the superego and ego-ideal concepts in psychoanalysis. The superego is categorical, rigidly vindictive and punitive; this would mean in an adult a pathological formation. The ego ideal is more flexibly bound to the ideal of a particular historical period and closer to the ego function of reality testing. Identity formation, according to Erikson, has a self aspect and an ego aspect, that means, it is a subjective and an objective phenomenon.

Erikson tries to reconcile psychoanalysis with sociology and with the rich ethological and ecological findings of modern biology. In this endeavor Erikson has been, according to his self-critic, "all over the map" (p. 164). These collected papers are more stimulating than systematic, though his diagrams present an attempt at systematization. This reviewer particularly regrets the lack of a sharp distinction between the necessarily heteronomous morality of the dependent child and the moral autonomy starting in the relations of equality and mutuality in preadolescence, that such writers as Piaget and Sullivan have emphasized.

Edith Weigert

MAUTNER, HANS. *Mental Retardation: Its Care, Treatment and Physiological Base.* Pergamon Press, New York, 1959. vii + 280 pp. $5.50.

The reader who buys this book on the basis of its title will be sadly disappointed. Rather than presenting a comprehensive and organized view of the care, treatment and physiological base of mental retardation, the author's efforts are almost entirely limited to a report of research findings and symptom pictures of physical disease entities, many of which have only minimal relationship to mental retardation. It is a little surprising to find chapters on muscle diseases, erythroblastosis, heart and circulation, and thyroid diseases in a book concerned with mental retardation. One would not object to such chapters were their pertinence to mental retardation more clearly delineated by the author.

The choppy and disorganized character of this book may in part be due to its format, the manuscript being a compilation of lectures given by the author to the staff of the Pineland Hospital and Training Center. Although each chapter is headed by a lecture number, it is doubtful that the original lectures were faithfully reproduced in the text, since many of the chapters are no more than six or seven pages in length. Excluding references, the general problems of mental retardation are handled in a chapter six pages in length, familial oligophrenia in six pages and psychoses in seven pages. Including references, the twenty-five chapters of the book are presented in 258 pages. Since it is not uncommon to find a six-page chapter followed by two pages of references, the reader gets the distinct impression that each chapter is little more than an annotated bibliography of the chapter heading. This impression is strengthened by the haphazard and non-evaluative manner in which research findings are presented. In many chapters the author makes no effort to synthesize the research findings nor provide a conclusion for the reader. In those few chapters where conclusions are presented they are often a sentence or two in length and there is little or no effort expended in demonstrating how these conclusions were derived from the research findings preceding them. Adding to the difficulty is the author's penchant for introducing anecdotal evidence and alloting this type of material much more weight than it would appear to merit.

This book will be especially offensive to individuals who feel that the problem of mental retardation can only be encompassed within a conceptual framework which includes both organic and psychological factors and the interaction between such factors. In those instances where the etiology of a complex organismic process, *e.g.* psychosis, is in doubt, the author insists that such an etiology must be either purely organic or purely functional in nature. He then invariably dismisses the functional orientation or even the possibility of an interaction between the functional and organic factors in favor of the organic point of view. The reader is then faced with the disconcerting notion that mongoloidism and familial oligophrenia are "inherited or genetically determined" and that all psychoses are invariably caused by organic factors. Readers will also be surprised by the author's suggestion that a sizeable portion of institutionalized familial retardates were "look-outs" for criminal gangs that have been caught. Since a number of unsavory traits have questionably been attributed to this type of retardate, it would appear a disservice to emphasize the inherent criminality and lack of inhibitory controls of this group. This disservice is magnified by the nature of the evidence presented in favor of it, namely that many of this type of retardate have physical features reminiscent of Lombroso's criminal types.

It may be concluded that if one employs this book at all its role would be supplementary rather than basic, and discursive rather than expository.

Edward Zigler

SEARLES, HAROLD F. *The Nonhuman Environment* (in Normal Development and in Schizophrenia). International Universities Press, New York, 1960. xvii + 446 pp. $7.50

This reviewer considers Harold Searles one of the most important psychoanalytic writers on the current scene. When I heard from a colleague that Searles had just published a book entitled *The Non-Human Environment* I immediately had a number of fantasies about the possible meaning of the title and was in a fret to get my hands on the book to find out which fantasy was correct. It turned out they were all incorrect. Actually this book deals with its title in the most literal sense; namely, a consideration of the influence of those things which have meaning for us and are not people. The world is full of a number of things from pets to pizzas and Doctor Searles rightly makes the point that this aspect of our living has been relatively ignored by psychoanalytic theorists and unattended by therapists.

While Searles' thesis is a valid one, I have a minor discontent over the fact he did not present it in a paper and save his book effort for a presentation of his important ideas about schizophrenics. It is even possible that some readers will shy from the unusual title and thereby miss the real meat of this book—the reporting of clinical experiences by a brilliant and dedicated therapist.

The problem of orienting a book around the non-human environment would pose serious difficulties for anyone. One can only demonstrate by examples from fiction, biography, and life in general that non-people are an integral part of people, and one can adumbrate psychoanalytic ego psychology to show how the non-human objects go along with human development. These things Searles does, but beyond them it is difficult to go without being merely repetitious. On page 54, the beginning of Chapter Three, "The Non-Human Environment in Subsequent Healthy Personality Development," Searles states: ". . . . I wish to avoid insofar as possible observations which are banal; for example, it seems to me unnecessary to elaborate upon the obvious points that the personality of a healthy human adult in our culture cannot be considered entirely apart from the individual's car, his home, his clothing, and all his manifold other possessions nor apart from the particular skills

which he possesses in dealing with his non-human environment (whether in his daily work or in his hobbies) nor apart from his animal pets and so on. It is clear enough to everyone, I think, that all these are, in a very real sense, ingredients of the human individuals' personality in our culture."

This seems to the reviewer to be a very fair statement and to point up the difficulty of teasing out the personality from its matrix or the figure from the background. However, Searles then develops his thesis of the importance of the non-human environment for the next forty-five pages and reworks the same material in Chapter Four entitled, "The Mature Person's Attitude Toward His Non-Human Environment." Moreover, the gist of these two chapters is to be found in bits and pieces throughout many psychoanalytic writings on ego development. Most authorities agree that there occurs from infancy a process of differentiation that is central to psychoanalytic theory. Whether it is expressed in terms of the supposedly shattering discovery that the breast belongs to mama and is hers to take away, or the more helpful discovery that this little pinky is attached to me and that bottle over there is not, the process of becoming a person involves things as well as other persons. Searles' efforts do present us with an emphasis on the non-human environment which has heretofore been mentioned only in passing by experts on ego psychology. He has carefully and laboriously included all relevant literature and thereby saved the student much searching. As a general discussion of psychoanalytic ego psychology and its relation to schizophrenia, these chapters take their place along with the superb discussion of ego psychology by Freeman, Cameron and McGhie in their book on chronic schizophrenia.

Beginning with the section on "Psychoses and Neuroses," the chapters are replete with interesting clinical illustrations that would only be available to a therapist who has worked intensely with very sick people for many years. Note that I use the word "therapist" rather than "observer" or some more research-oriented word. Whatever the point Searles is making in an example from an interview with a patient, he never fails to indicate the therapist's presence, the therapist's reactions, and his influence on the total interaction. These clinical descriptions should be particularly valuable to the student or young psychiatrist overcoming his bug-on-a-pin attitude toward schizophrenics.

There is a rather central issue at stake in Searles' presentation of clinical material that demonstrates how schizophrenics think about their non-human environment. This issue was perhaps what Sullivan referred to many years ago when he stated that he did not believe schizophrenics had a thought disorder so much as a tendency to say what they thought other people expected. There is a great difference between ascribing concrete thinking to the schizophrenic as a partial manifestation of his difficulty in differentiating himself from his environment ("loose ego boundaries") and in viewing this literal thinking as a message to the hearer. Searles perhaps underestimates the communication aspect of the schizophrenics' message because he states on page 154: "That is in my experience, that schizophrenic patients' thinking is largely restricted to a literal concrete level because he must struggle to distinguish between, for example, human beings and animals and human beings and inanimate objects. He is not able to make such distinctions sufficiently easily to be able to move on in his thinking to the higher level of being able to refer all these in abstract figurative terms, terms which so often involve equating one kind of perceptual object with another, in many ways very different kinds of perceptual objects. He is too prone to mixing all of them up in his thinking—too vulnerable to confusing them with one another even at a literal level."

There is evidence from family studies that schizophrenics may refer to non-human objects in an apparently confusing way be-

cause they have learned it is dangerous to be more personal. The patient who states, "That dog looks sad," may convey to the hearer that he is describing himself. However, such remarks in his own family group are almost always taken at a literal level and lead to a discussion about the dog and not about the patient. Some years ago, I facetiously remarked that it was too bad that Doctor Benjamin had not given his proverbs to the schizophrenic parents rather than just to the patients. Now, to my delight, I find that Doctor Margaret Singer has done just this with some of the families from the National Institute of Mental Health. Her tentative findings would indicate that the parents score very literally on the test proverbs. This may be viewed as a thinking disorder, which indeed it is, it may also be viewed as one of the methods in human communication by which one can keep from commenting on the nature of his relationships.

The few criticisms I have made of Doctor Searles' book do not detract from the fact that it, generally, is an excellent publication. As with his previous work, it will add to his already important position in American psychiatry.

Don D. Jackson

ABRAMSON, HAROLD A., ED. *The Use of LSD in Psychotherapy* (Transactions of the 1959 Conference). Josiah Macy, Jr. Foundation, New York, 1960. 304 pp., illus. $3.50

In our present state of knowledge, the evaluation of results in psychotherapy must depend almost entirely upon the clinical impression of the therapist. This is especially true when it is a question of assessing personality changes in psychoanalytic treatment. Extremely difficult methodological problems must be solved before more objective tools of measurement can be developed.

It is clear that this creates a situation in which the reliability and skill of the investigator studying the psychotherapeutic process are crucial. Unfortunately, psychotherapy continues to be a happy hunting ground for adventurers who feel that uninhibited enthusiasm is an adequate substitute for training and experience. Particularly irksome is the amateur psychotherapist, who without taking the time to learn what has been accomplished in the field, recklessly experiments with new and often dangerous methods in a fruitless search for miraculous results.

These comments indicate something of the reaction this reviewer had when reading *The Use of LSD in Psychotherapy* (transactions of a conference on d-Lysergic Acid Diethylamide). This three-day conference, sponsored by the Josiah Macy, Jr. Foundation, was held in April, 1959. The twenty-five participants all had had some previous experience with LSD, either as investigators or subjects. The composition of the group strikes one as curious, since it included, on the one hand, men of understanding and experience, such as Dr. Paul Hoch and Dr. Louis J. West, and on the other hand, investigators who are embarrasingly ignorant of the most elementary concepts of both the theory and practice of psychotherapy.

The discussions were focused around four presentations. Harold Abramson explained his use of LSD in "psychoanalytic psychotherapy." Using a verbatim therapy session as illustrative case material, Abramson maintained that the occasional use of moderate doses of LSD facilitates the expression and analysis of "transference" feelings during periods of resistance. Whatever may be the therapeutic value of this technique it is doubtful if transference manifestations can be analyzed in the context of such a flagrant abandonment of analytic objectivity. The counter transference attitudes implicit in this use of LSD did not go unnoticed by certain of the participants.

Following Dr. Abramson's presentation Ronald A. Sandison, a British analyst

trained in the Jungian tradition, gave his views on "The Nature of the Psychological Response to LSD." He was followed by C. F. van Rhijn, a Dutch psychiatrist, who presented a vision "of mass therapy: institutions in which every patient with a neurosis could get LSD treatment and work out his problems largely by himself."

Finally, Henry L. Lennard, who described himself as a social scientist, and Mollie P. Hewitt, an architect who somehow became interested in LSD, discussed "Communication Processes under LSD."

It would be a waste of the reader's time to consider these contributions in detail. The outdated psychoanalytic topographical model was extensively employed both to justify the use of LSD in psychotherapy and to try to explain its "results." Sandison, for example, stated (p. 81), "The core of my thesis is that the essential psychological change produced by LSD is the activation of the unconscious." Van Rhijn (p. 155) spoke poetically of resistance as "a sort of passive barrier against the subconscious energies flowing into consciousness." All this, of course, is reminiscent of the very early days of psychoanalysis when the terms "ego" and "consciousness" were used interchangeably.

The quality of the informal verbal exchanges among the participants was extremely uneven. Much of it lacked sophistication and some of the comments can only be termed irresponsible. The following interchange among Dr. Hoffer of Saskatchewan, Dr. West and Dr. Gregory Bateson is quoted without further comment (pp. 18–19).

Hoffer: ". . . we began to study a group of very difficult psychopathic alcoholics. We have now treated sixty of them, and half are no longer alcoholic after one treatment; so we do see that this drug has great potential for changing people.

West: What is the period of follow-up?

Hoffer: Five years.

West: One treatment, and a five-year follow-up?

Hoffer: Yes, and half of them were no longer drinking. You will not believe it, and I would not have, either. The results are very impressive, though I believe the drug must be used very carefully. It could also be harmful.

Bateson: Are they neither psychopathic nor alcoholic now?

Hoffer: That is correct."

Fortunately, the proceedings had their share of thoughtful comments, particularly by Drs. Hoch and West. The following remarks by Dr. Hoch indicate the degree of caution one should exercise in evaluating psychotherapeutic results with pharmacological adjuncts (pp. 76–77).

"I don't feel at present that any of the compounds used in conjunction with psychotherapy are really specific. Their selection is based on the therapist's opinion; or they are sometimes selected because of a patient's request. . . . I am rather skeptical about the "do-it-yourself" method of psychoanalysis or psychotherapy, under the influence of a drug. We ought not to assume, as we assumed with the tranquilizing drugs, that the compound is able to reduce or to alter the patient's emotional tension, so that the patient's ego becomes capable of dealing with material which he previously could not handle."

Walter Weintraub

WAELDER, ROBERT. *Basic Theory of Psychoanalysis.* International Universities Press, New York, 1960. xiii + 273 pp. $5.00

If one seeks the "pure gold" of Freud's psychoanalysis, it can be found in this book. Dr. Waelder does not hedge on the issue; "Psychoanalysis is largely the work of one man" (p. 33). It may be added to but not revised or compromised; in this, it is likened to the Copernican heliocentric system.

Dr. Waelder is one of a handful of psychoanalysts today who could have written this book, and for the following reasons. He is a